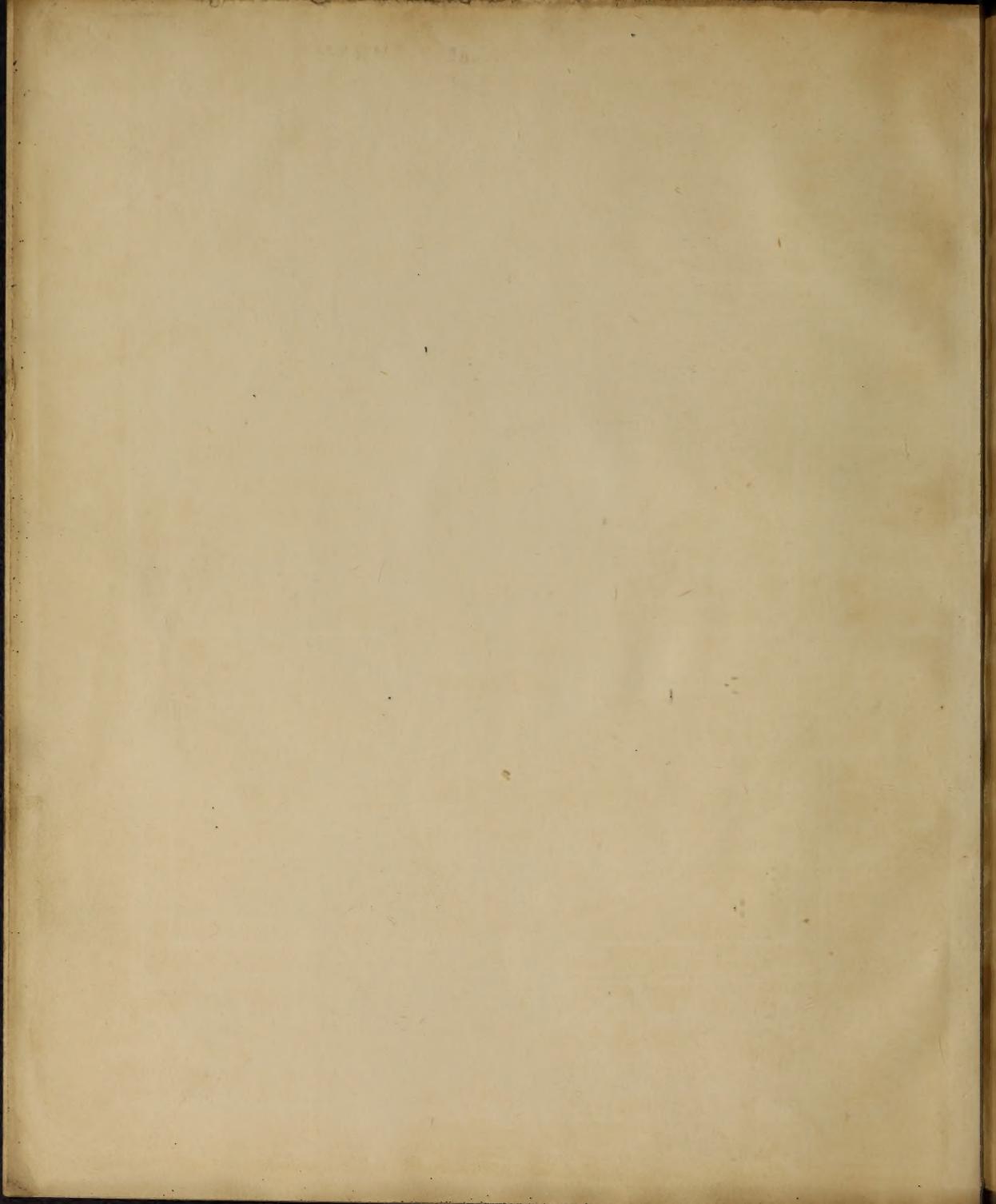


**
No. 7.3.3





12^h
1/2

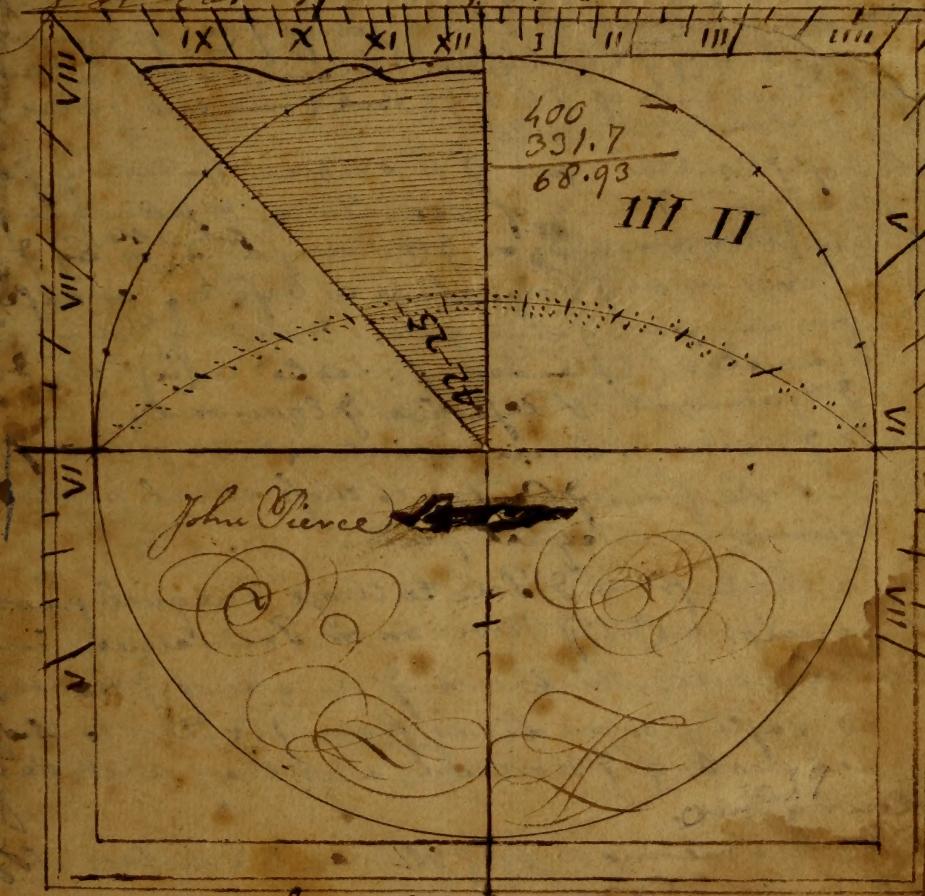
BOSTON JUN 19 1703 4

308
100
192.7
331.7

Dyalling

To make out Horizontal Dyals

for Lat 42° 9' N.



In Horizontal Dials, the Propor^{ns} are these
As Rad: is to In. of Lat^d So is Tan. of an Equi. horo.
To y^e Tan. of y^e Horo line diff^d from y^e mer. or Substide.

To Project a Horizontal Dial.

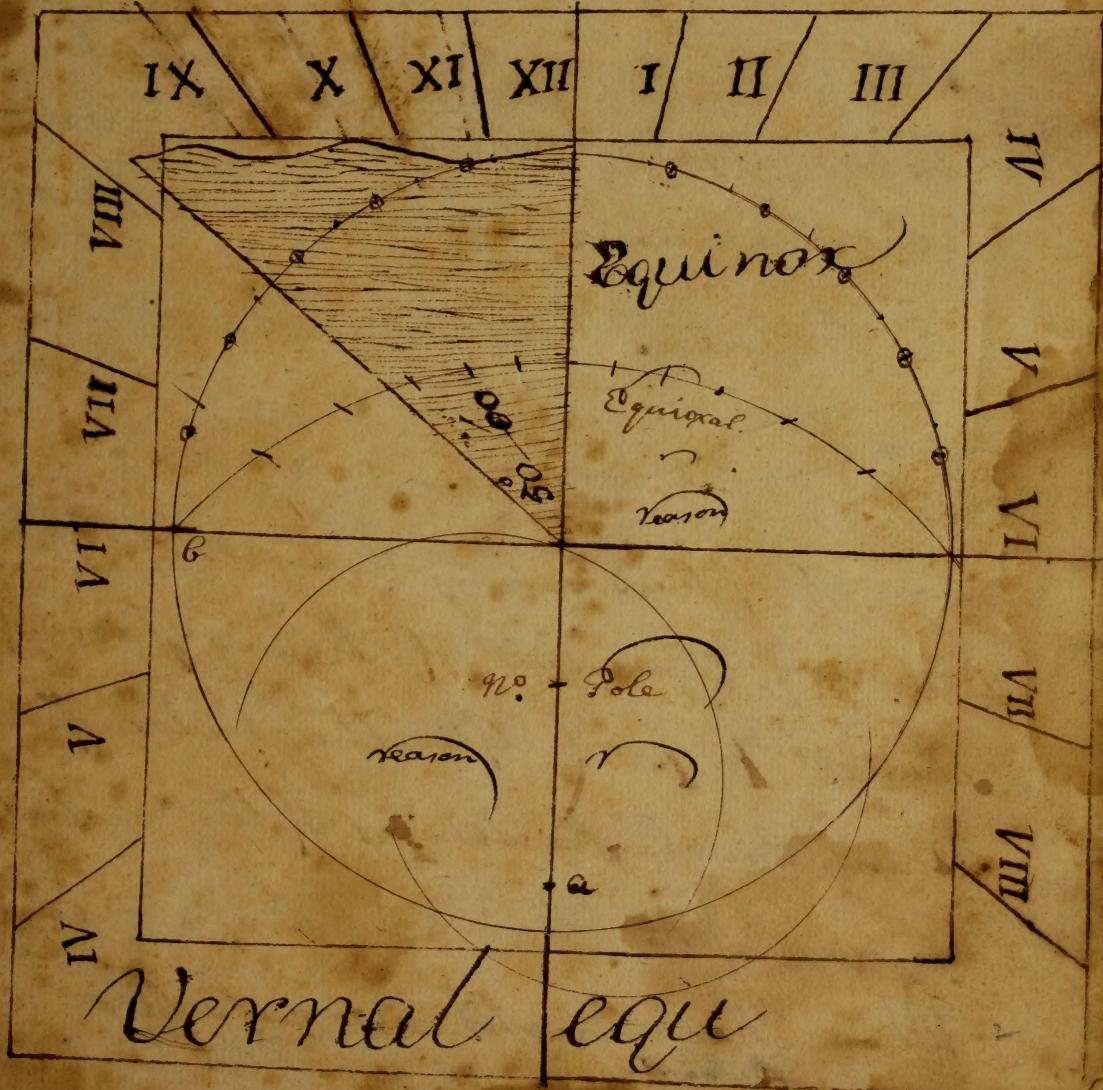
1. Describe a Circle with a Chord of 60 Degrees.
2. Crofs of Circle at N. angles, being of meridian of place & of hour line of 6. & of Circle is of Horizon.
3. Find of Pole upon of meridian, by Setting off of Comp. Lat. from of Center on of line of semi tang. Or from of line of chords, & off of Comp. Lat from one end of of 6 of clock line, & laying a Scale from the other end of of 6 of clock line cut of meridian in of pole of of circle.
4. Set of of Equator upon of meridian by taking of Lat. of place from of line of semi tang. & setting it from of Center downward, or of contrary way, or by of line of chords upon of primitive as before, or else take of Comp. Lat. from of line of See. & setting ^{one} foot in of Chord of diameter (extended if need be) in (a) is of Center of of Equinoctial, & descriptive of Equinoctial.
5. Divide of Horizon or primitive into 24 equal parts, or 12 inter.
6. Lay a Scale from of Center to these equal parts cut of Equinox in unequal parts.
7. Lay a Scale from of pole to those unequal parts of of Equator & cut of Horizon or primitive in unequal parts, which are of angles of of hour lines.
8. And lastly draw lines from of Center to those unequal parts of of Horizon, and they will be of hour lines.

In like manner for of halves & quarters, if of dial be large, and required.

Note, of height of of stile is equal to of Lat. of place. And when of dial is finished, it must be faced about, of north part to of South; because of shadow is contrary to of Sun, & so it must be placed.

Dyalling

Longitude Horizontal Dials
Lat. $50^{\circ} 00' N$ Lat



Bad books are the fountains of vice

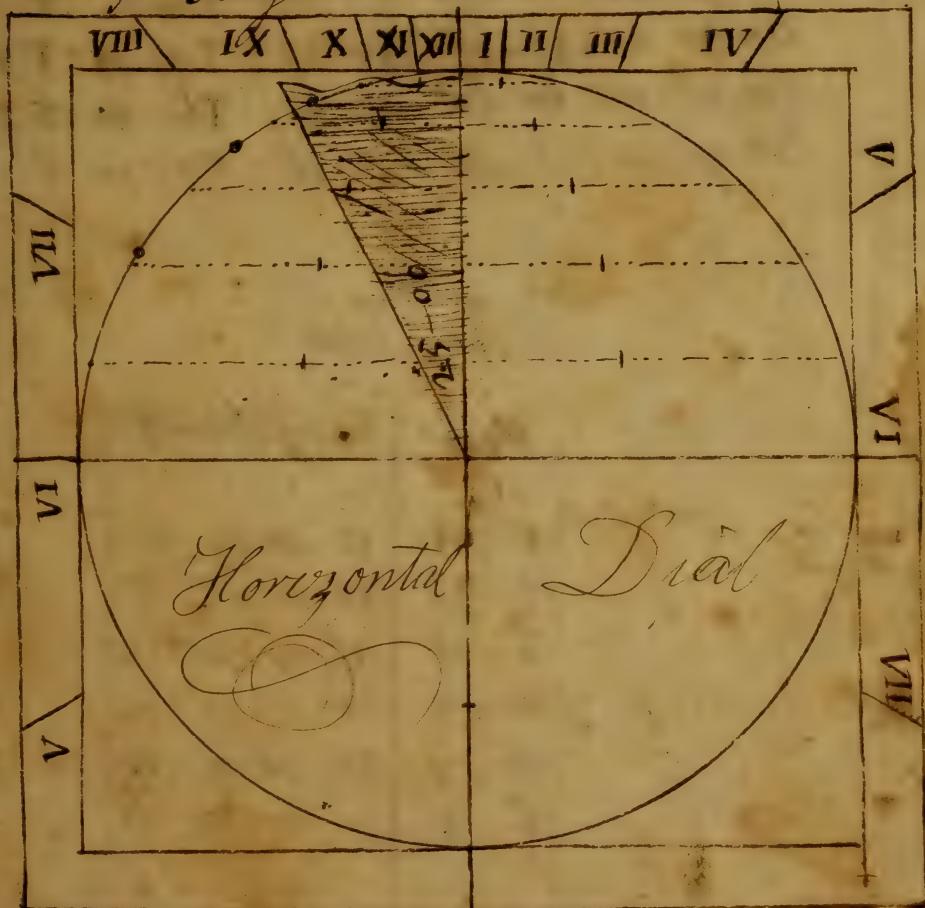
Of Dangers which befall us in General,
and likewise of the Events, which
have happened to ^{the} America ^{nt.} since
the time that they have been
a People.



Our Forefathers serving under the
Despotic Tyranny of King James,
thought proper (after they had suffered
many cruel hardships of this noted
Tyrant) to be in Quest of a place
where they might more fully
enjoy ^{Liberty} and therefore,

Dialling

Horizontal Dial Lat^o
 $25^{\circ} 00' N.$ performed Geom.
 & Trigonometrical



As Rad^o $90^{\circ} - 00$
 is to In. Lat^o $25^{\circ} 00$
 so is Tan^o Equ^o hours $15^{\circ} 00$
 to Tang. of an hours distance from Subs^o $5^{\circ} 46'$

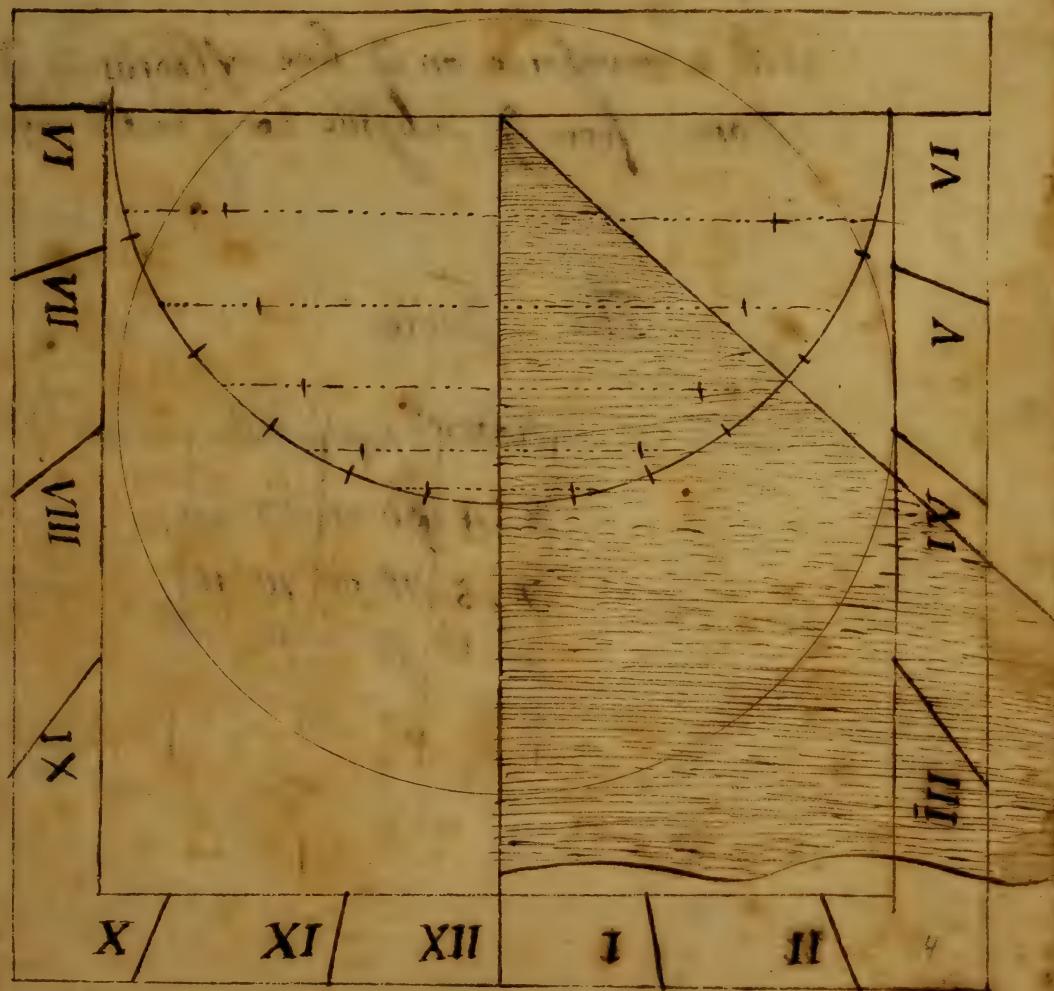
The Proportions are these

~~Sn. 90-00~~; Com. Lat. 47-35; T 15-00; T 11-15
~~Sn. 90-00~~; Co. Lat. 47-35; T 30-00; T 23-05
Sn. 90-00; Co. Lat. 47-35; T 45-00; T 36-22
Sn. 90-00; Co. Lat. 47-35; T 60-00; T 52-00
Sn. 90-00; Co. Lat. 47-35; T 75-00; T 70-10

The Table

Hours	Deg. Equ.	Deg. Subside
12		
1 .. 11	15-00	11-15
2 .. 10	30-00	23-05
3 .. 9	45-00	36-22
8 .. 4	60-00	52-00
5 .. 7	75-00	70-10
6 .. 6	9-00	90-00

Dyalling —
So to make the East Dial
To Dye for Lat^o 42° 25' et^o
Geometrical & trigonometrical



The Proportions are these

Sn. 90-00; Co. Latt'; T60-60; T32-00

Sn. 90-00; Co. Latt'; T75-00; T70-10

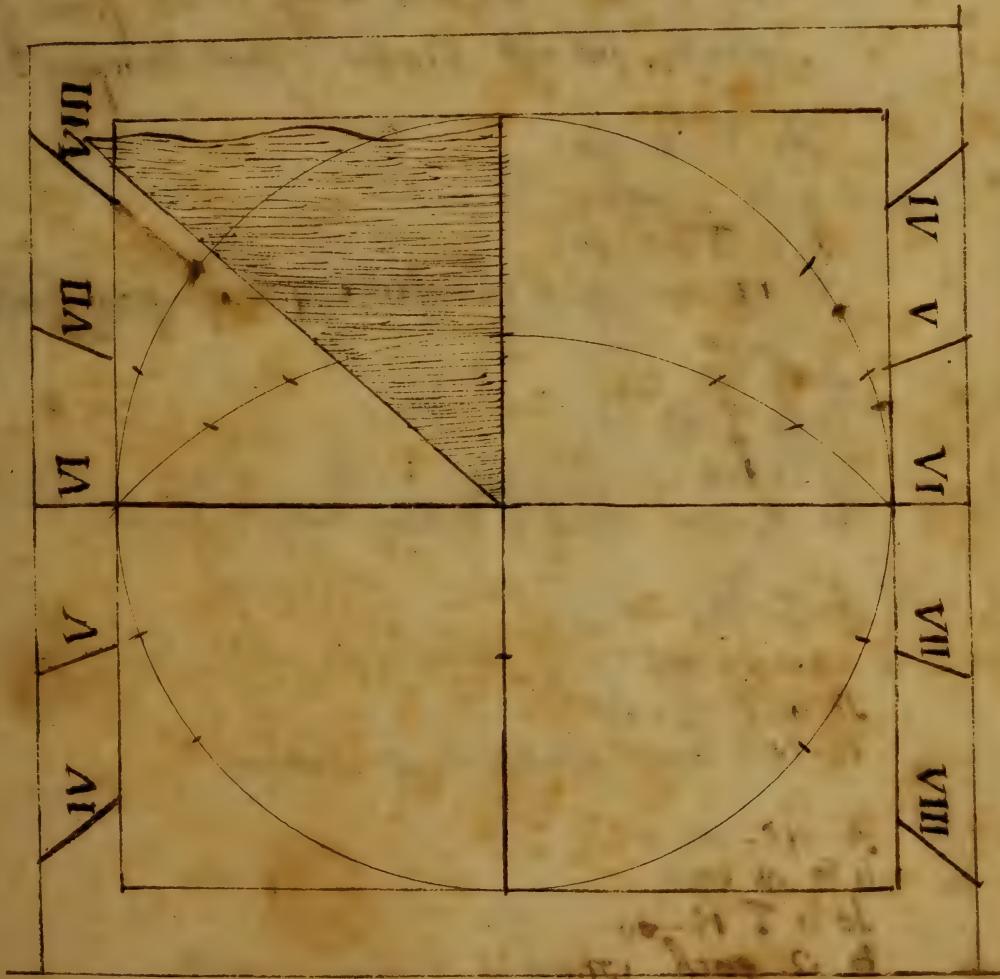
Which measured on y^e line of Chords is y^e
distance from y^e Substile to y^e outer line

The Table

Hours	Eq	dist.
8.4	80-00	52-00
7.5	75-00	70-10
6.6	90-00	90-00

Dialling

To make a N. erect direct Dial
Lat. 42° 25' N°



The Proportions for this Dial are these

The 5th & 7th Hours being 75-00 from of
Substile, and also 3 enches distant therefore I say

As T 75-00

is to 3 enches

So is T 60-00

to $\frac{14}{10}$ ench. which is distance of hower from Substile

As T 60-00

is to T 45-00

So is $\frac{14}{10}$

to $\frac{8}{10}$ ench which is distance of 3 hower

As T 45-00

is to ,8 ench

So is T 30-00

to ,52 ench. which is of 2 hower

As 45-00

is to ,8 ench

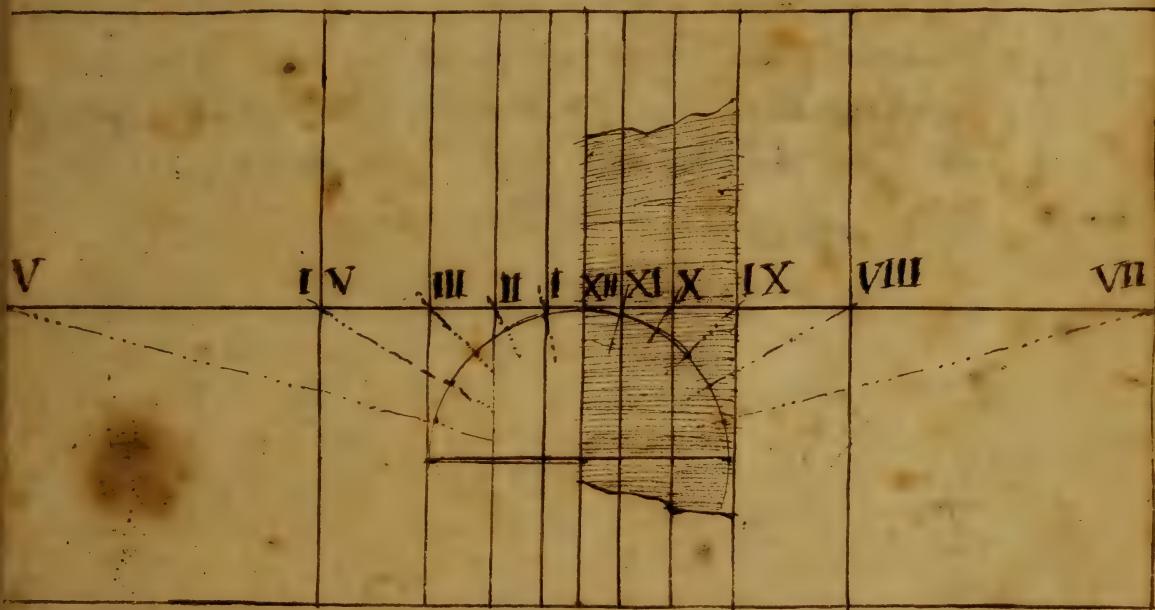
So is T 15-00

to ,2 ench which is of first hower

Note the height of stile must reach to 3d. hower.

Dialling

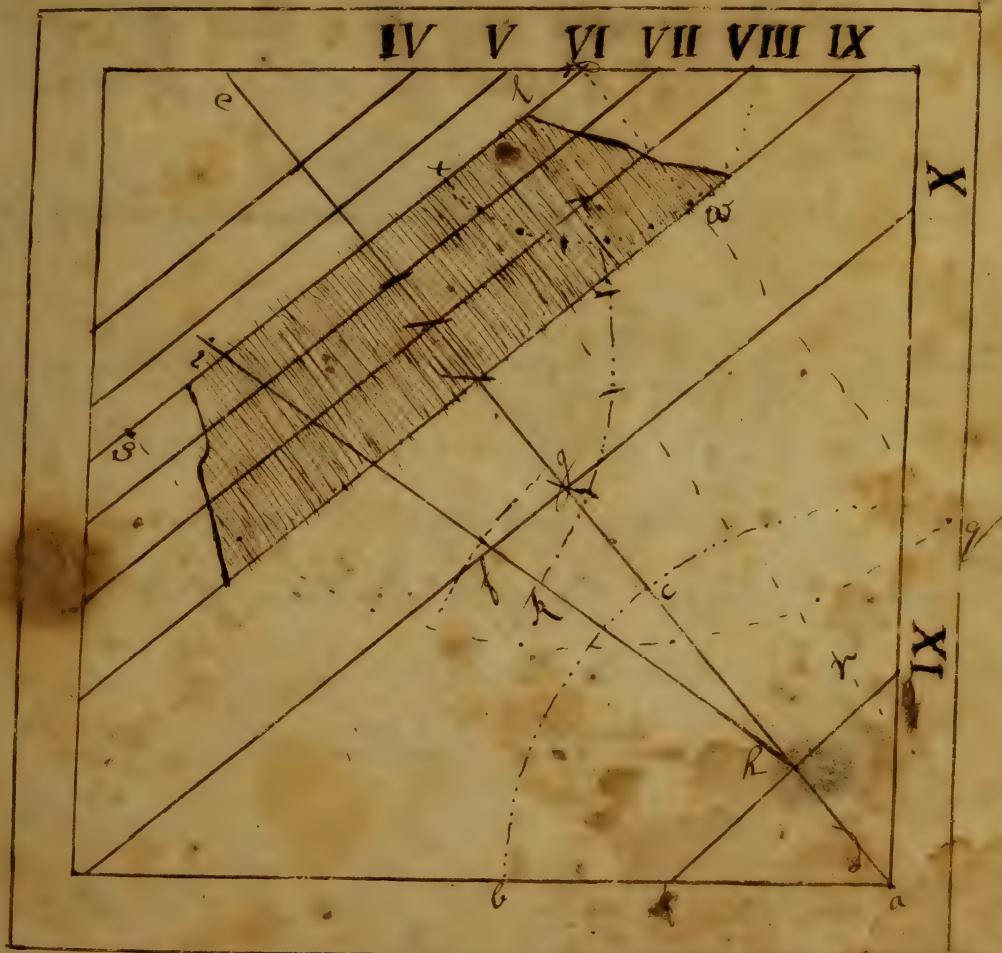
How to make an Equinoctial Dial
or a dial on which neither pole has any
Elevation on its plane,



Having made a Square I assume a Point as y
Point a, then setting of y^e Com^t Latt. from b to c I draw
the line d^e which represents y^e Equinoxal, then I assume
y^e a Clock line at right angles to y^e Equin^l ~~at y^e line~~
~~g~~ Then I assume y^e 6 Clock Line h, and setting of 15°
downward on y^e arch f^g and from h, I draw y^e line h i:
Then setting y^e one foot of y^e Compasses in i, I do ~~over~~ the arch
k l which being divided into 5 equal parts, the number
of hours from 6 to 11 and laying my Scale from those
divisions to y^e Center i, I mark where it cuts upon
the Equin^l. And through that Point parallel to y^e 6
Clock line I draw the ^{other} hour lines.

Another way is to make y^e Quadrant of w^x off
Same Radius with y^e height of y^e Stile, & dividing it into 6
~~hours~~ Equal parts cut y^e Tangent line x v. is will be y^e
Hour Lines. Or more Exact, Describe a larger
Quadrant, as S. y^e & divide it as before. But stile cut
upon y^e same Tangent Line that is raised from y^e Center
at y^e Distance with y^e height of y^e Stile.
This will do without setting off y^e 15 degrees downward.

Dyalling
To make an East Dorect
E. Dial for Lat: 39° 41' EV.



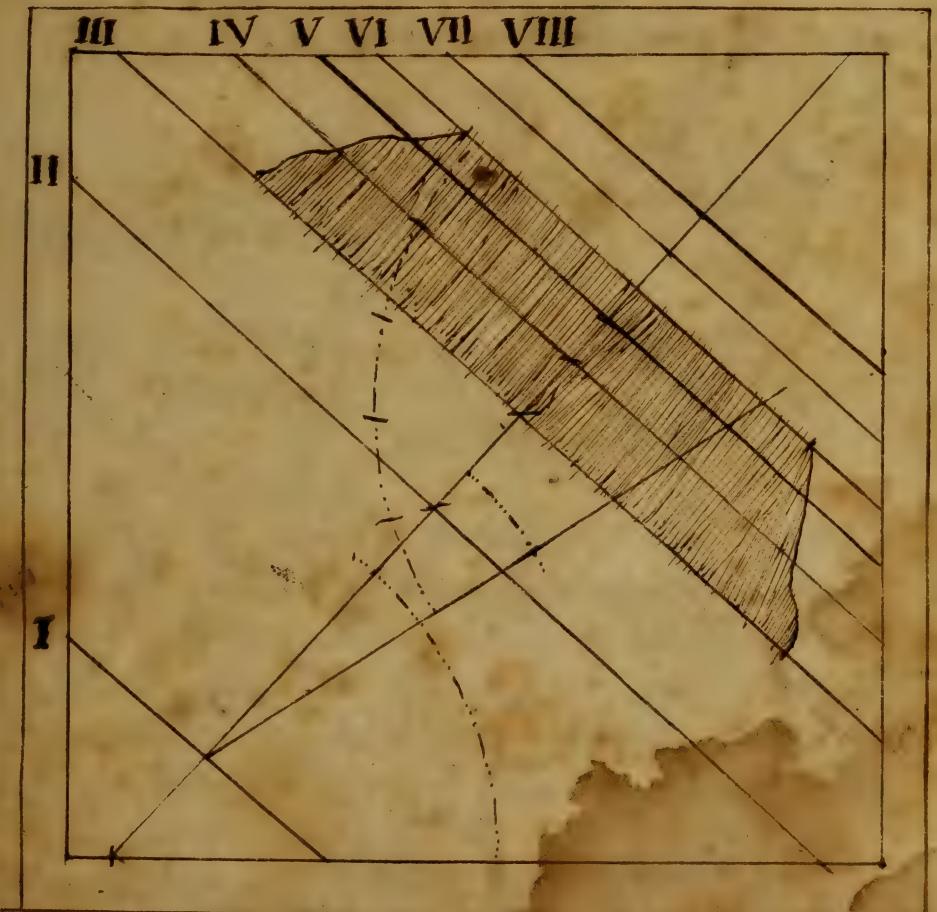
Their is no difference betwene this Diall
and the former, only this, that of Equall
line is Set of from the other part of the
Square. - - -

There is nothing more commendable in life
than to spend ^{one's} time well; yet Mankind in
general are so far from consenting to this
Maxim, that they absolutely manifest by their
Behaviour their disapprobation of it, by quan-
-dering away that time in Trifles, which is
assign'd to them for nobler Purposes.

It is the Nature of Man to do those things
in the doing of which he feels great Pleasure,
but upon Reflection is filled with Remorse & Regu-

Dyalling

Sonneheiret Eret Direct $W^{\circ} 6^{\circ}$
Dialekt $42^{\circ} 26' N^{\circ}$



The Proportions are these.

As Co T Com	Dec. 60-60	9,761.439
Is 20 Qd		
So is G In Com Latt	90-00	10, -
So Co T Indin Merid	47-35	9,828.993
	40-38	10,066.554

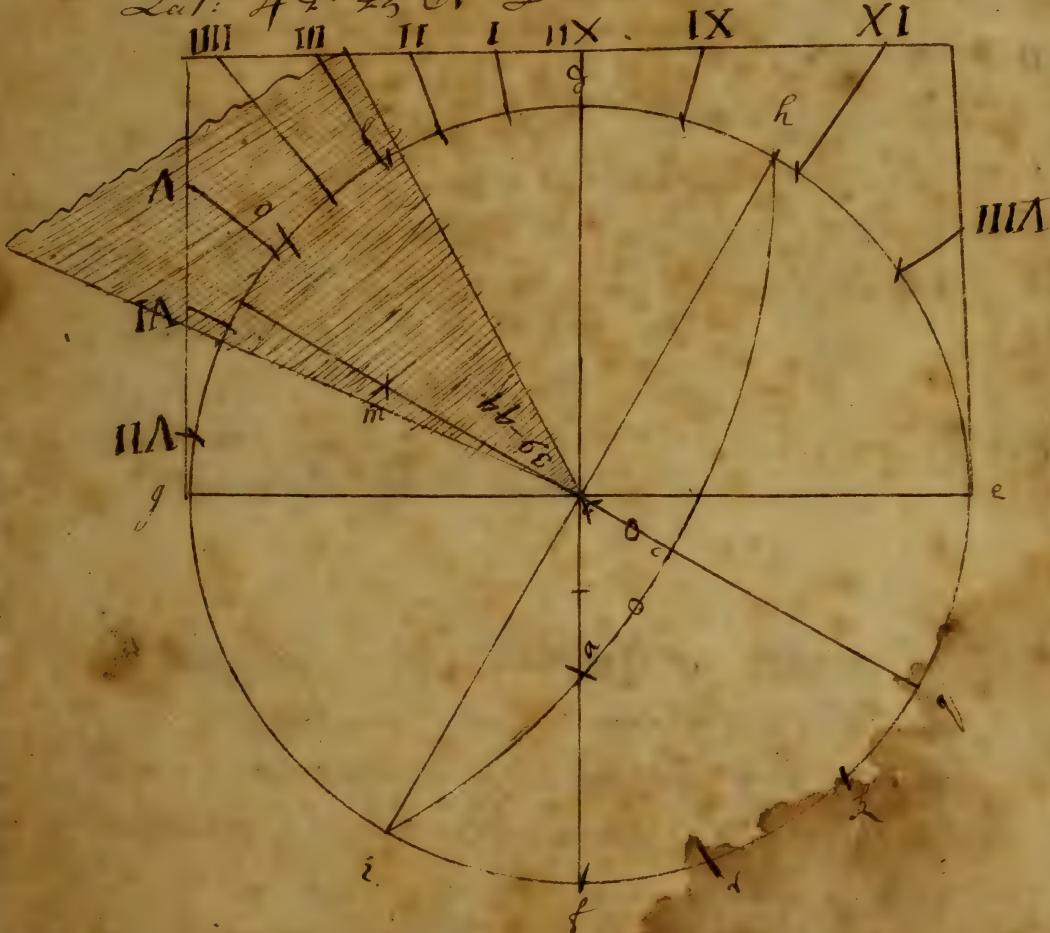
As	6	T Com Latt.	47-35	9,960784
Is	to	Res	90-00.10,	—
So	is	6 In ^{Com} Dec.	60-00	9,698970
to	T	Sub filers diff.	28-41	9,738186

As Rad.		9,738180
Is In Com Latt	90-00	10,-
So is In Com Dec.	47-35	9,868208
To Poles height Plain	60-00	9,937530
	39-44	9,805738

After I have described y^e Circle & crossed it at right angles d^s represents y^e merⁿ of y^e Place, then I set of the declⁿ of y^e wall from d to h also from f to i & draw y^e line hi then setting of y^e Latt. of y^e place from f to L & laying my Scale from L to g I mark y^e point a which is y^e Pole, & setting of y^e declinⁿ from d to l & laying my Scale from that to i I mark y^e Point m which is y^e Pole of y^e oblique Circle iake 30 deg^r distant from it. The ^{measur} of y^e Angle at a done by laying y^e Scale from y^e Angle ¹ to y^e pole of y^e oblique circle & cutting at o from o to g is y^e measure of y^e angle

Dyalling

To make an Erect declining Dial for
Lat. $42^{\circ} 25' N.$ Declination $30^{\circ} 00' 10' E.$



The hour Table followeth in the next page

Hours	Ext. dist.	dist. from Substile
5.7	64-22	53-60
6.6	49-22	36-43
7.5	34-22	23-37
8.4	19-22	12-44
9.3	4-22	2-47
10.2	10-38	6-47
11.1	25-38	17-03
12	40-38	28-10
1.11	55-38	43-00
2.10	70-38	61-26
3.9	85-38	83-10
4.8		
5.7		
6.6		
7.5		

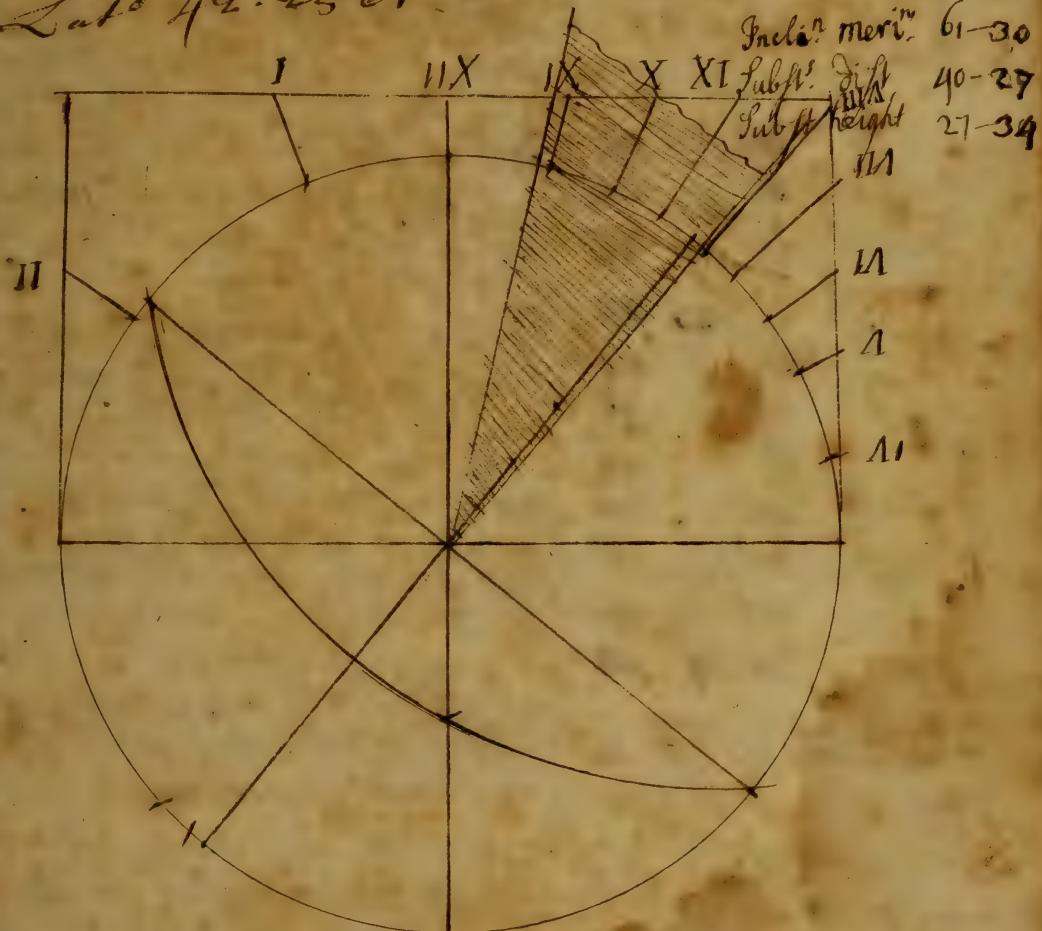
The Proportions to find the
distance of 4 Horser-lines
from y^e Substile is

As Tan 90°-60°
is to height of Stile 39-44
So is Tan. of an hours dist. upon Equit.
to T of an hours dist. Substile

Note, If y^e decl. be Westerly
the Stile must stand to y^e East-
ward; if Easterly the Stile must
stand to the Westward.

The measure of those sides of a Spherical Trian-
gle that pass thow^y the center are measured on y^e line
of Semi Tang^s. That side of y^e triangle which is made
by the oblique circle is reduced on y^e primitive by
laying y^e Scale over y^e Pole of y^e oblique circle & y^e
angle & cutting y^e primitive. The dist. from y^e center in y^e former
projection is y^e measure from a loc in y^e spherical triangle
abc. The measure of an angle is measured likewise as before
taught.

Drilling
To make an Erect Drilling Dial for
Lat^o 42° 23' N Declin^o 51° 10' 38" E



The Flower Table followeth in the next Page

Hours Degr Equino^x Distanc^x Subst^x

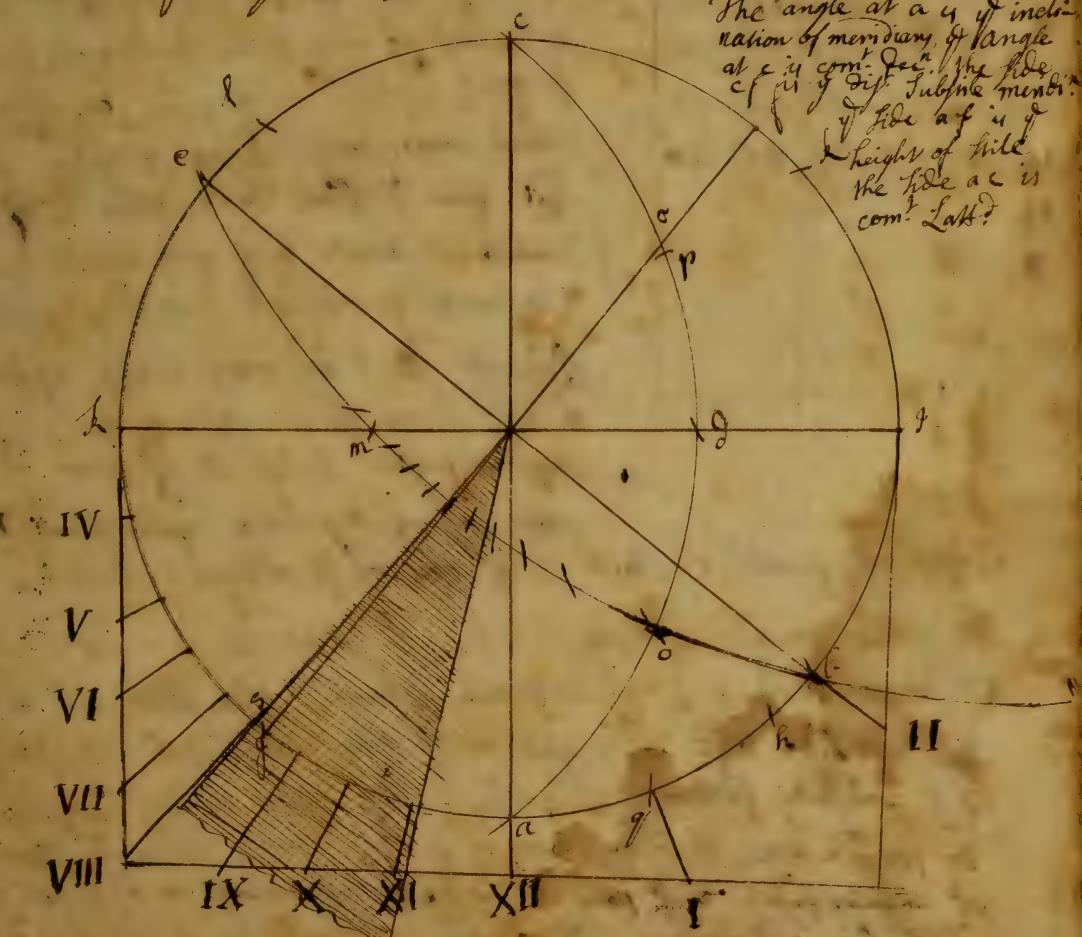
5.7		
6.6		
5.7		
4.8		
3.9		
2.10	91 - 30	86 - 47
1.11	76 - 30	62 - 39
12	61 - 30	40 - 26
11.1	46 - 30	25 - 08
10.2	31 - 30	15 - 50
9.3	16 - 30	7 - 48
8.4	01 - 30	0 - 41
7.5	13 - 30	6 - 29
6.6	28 - 30	14 - 06
5.7	43 - 30	23 - 42
4.8	58 - 30	37 - 08

Directions

After y^e Circle is described & crossed at right angles y^e 12 clock line is y^e axis, y^e line perpendicular to it is y^e east & west line, Then setting y^e Declⁿ Eastward from a to b, then laying my Scale from b to c & mark y^e point d through which I describe y^e oblique circle adc which is y^e meridⁿ of the place; also I draw y^e line bce which represents y^e wall & perpendicular to it y^e line fg which is y^e meridⁿ of y^e plain. Then I find y^e Pole of y^e Oblique Circle by setting of y^e declⁿ from b to g or from b to l & laying my Scale from either y^e m to a point 90 deg distant, as from g to c or l to a I mark y^e point m which is y^e pole of y^e oblique Circle. Then setting of y^e Lat. from a to h & from b to l & laying my scale from m to l I find y^e point p which is y^e pole of world, & likewise laying my scale from m to h I mark y^e point o which is y^e intersection of y^e Equi. with y^e meridian, then through y^e point m & y^e point o I describe y^e circle emb which is y^e Equino^x. Then laying my scale upon y^e Pole p & y^e intersection at o I mark y^e point q from whence I begin to divide y^e primitive into equal parts, & laying my scale upon them & y^e center I divide y^e Equino^x into unequal parts which done I lay my scale upon y^e pole p & y^e divisions on y^e Equin^x & cut y^e horerlines upon y^e primitive, then laying my scale upon y^e m & y^e center I draw out y^e horerlines upon y^e square. The Subst^x is found by laying my scale from y^e pole of y^e world over y^e center which cuts at s.

Dialling

How geometrically to project
the Yangtze River



Hours	Dift. Equn	Dift. Substile
8 . 4	49-05	19-36
7 . 5	32-05	10-30
6 . 6	17-05	5-08
5 . 7	2-05	0-36
	Substile	
4 . 8	12-55	3-50
3 . 9	27-55	8-51
2 . 10	42-55	15-13
1 . 11	57-55	25-00
12	72-55	44-50
11 . 1	87-55	82-50
10 . 2		
9 . 3		
8 . 4		
7 . 5		
6 . 6		

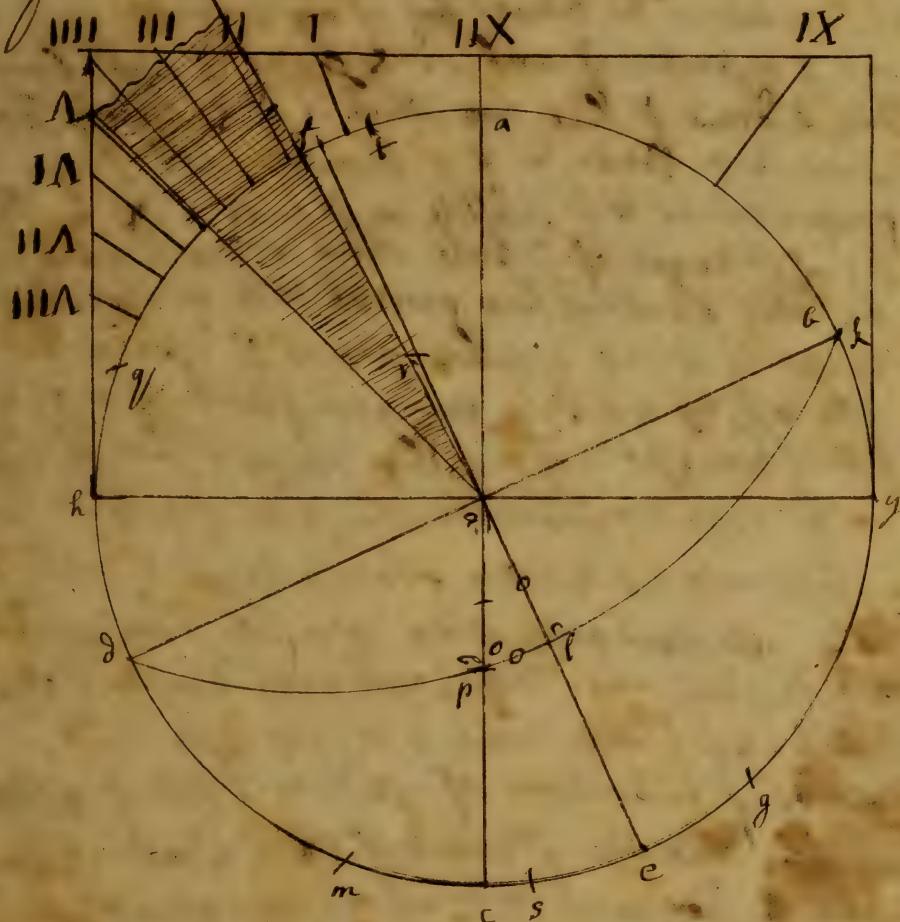
Inclination of Meridians 72-55
 Substiles distance — 44-53
 Stiles height — 17-07

The decⁿ is set of from a to b & from c to d, perpendicular to which is drawn g line e f. the Lat. is set of from c h g and laying my scale from g to h 3 man, & point p which is of pole, or else the which comes to of same I take of Com Lat from y^o Semi Tang^o & set it of from y^o Zenith or center to of pole, through which I describe of oblique circle, to find of Pole of it, I lay my scale upon L & l & cut m then taking of dift. of 90 in my compasses I set it of from m to q and laying my scale upon that & h & mark of point r which is of pole of of oblique circle.

In of spherical Triangle a b c, of angle at a is Com. Decⁿ of angle at b is of inclinations of meridⁿ the side a b is come Lat. of side b c is height of of side, the side a c is of dift. of of Substile from of meridian. the measure of of angle at a is from c to e. the measure of of c to b is done by laying of scale over of angular point & of pole r cutting t from thence to h of pole of of line h i is of measure. of measure of of side b c is from r to p cutting s from s to e is measure. a b, a c is measured on y^o Semi Tangents.

Dialling

To make an erect Declining Dial
for lat 42° 25' N Declin 65° 10' 38"



Inclination of meridians $86^{\circ} 38'$ or $5^{\circ} 46'$

Substiles distance meridian $47^{\circ} 28'$

Poles height from y^e plain $03^{\circ} 41'$

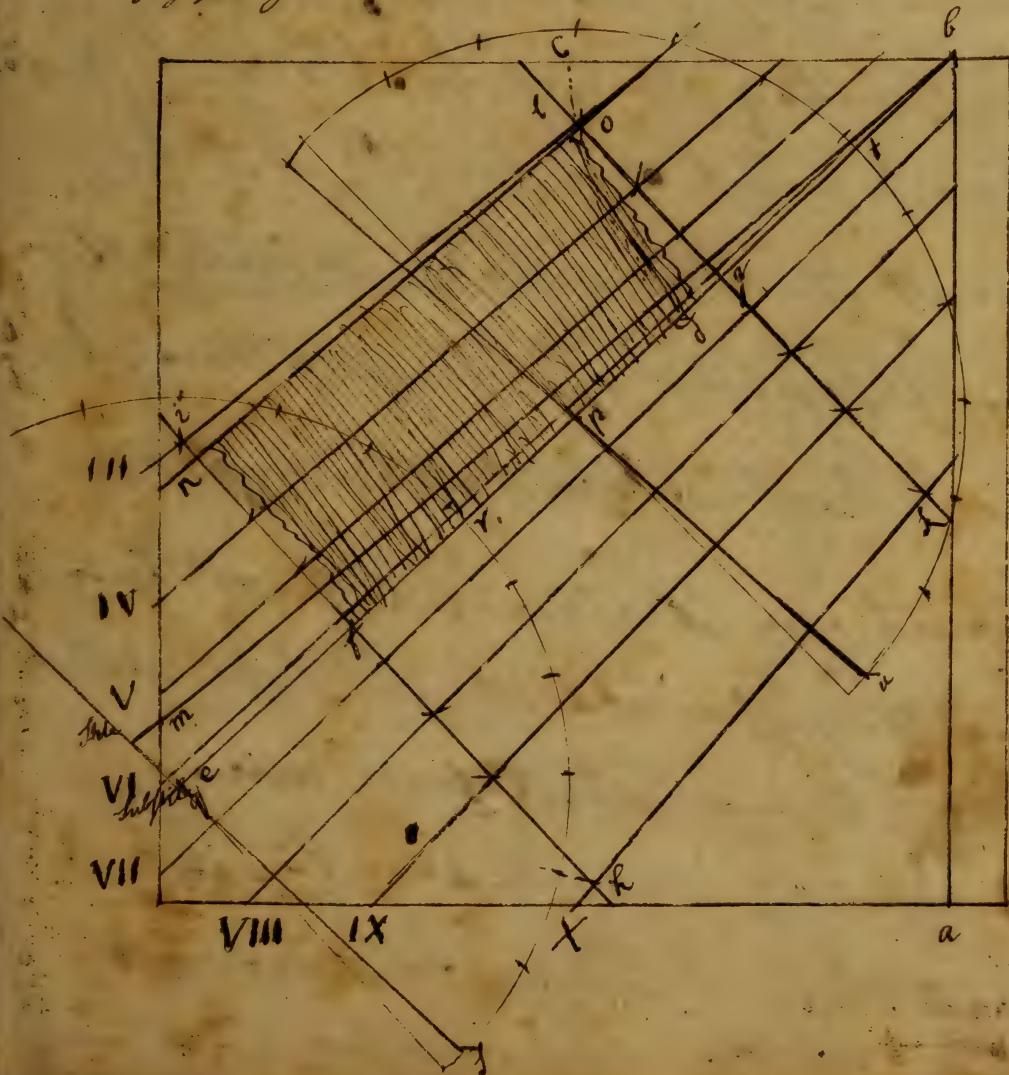
After I have formed y^e Square & drawn y^e line a b, I take a chord of 60, & one foot of my compasses in y^e angle at b I describe y^e arch c d & set of y^e Latt. from c to d. Then I draw y^e line b e which is y^e Substile. Then I assume two points as f. g through which I draw lines perpendicular to y^e Substile as y^e lines h i & l. Then I set of y^e height of y^e stile which is y^e line b m, to heighten the stile I draw a line parallel to it at what distance I please as y^e line n o, then taking y^e distance from y^e Substile to y^e top of y^e stile from g to o, I set it of at p, & y^e dist. from f to n, I set it of at q, Then taking a chord of 60 I describe those two semi-circles; then I set of y^e Declin. from y^e Substile at r to s & t to u, whare I begin to divide y^e semi circle into equal parts 15 deg^o in a part, then laying my scale from y^e center over those equal parts I cut on y^e straight lines h n & l l through which I draw y^e horoz lines.

Now by y^e Inclinations of meridians I find y^e Substile must be betwene y^e horoz of $6^{\circ} 7'$ & $8'$ nearer 6° then $7'$ which is directions to mark my horoz lines.

If it had been a west decliner their would have been no other difference but only drawing y^e Substile from y^e other upper part of y^e Square.

Dialling

To make an erect declining dial
for Lat $42^{\circ} 25' N$. Declin $25^{\circ} 00' E$ from
the south



The Tyrant granted them a certain
Place In America; ~~and~~ ^{And} they thought
fit to ^{set out} for this Solitary Wilderness;
~~After~~ Crossing the wide Atlantic, at
length they arrived at a Place, which
Now is called Nantasket; and they
found the Place to be inhabited
by altogether ~~of~~ ^{by} Savages; threat-
ning Destruction to them, if they
received any Detriment from them.
When they arrived at a Place called
by the Savages Mattapan now.
Dorchester. They began to ~~see~~ ^{try}
what this Solitary Wilderness
would produce

Hours from Sun.	Horizontal Dial. 42°-25'					Erect Direct S. Dial 12°-15'				
	Hours from Sun.	1/4 Hour.	1/2 Hour.	3/4 Hour.	Hour.	Hours from Sun.	1/4 Hour.	1/2 Hour.	3/4 Hour.	Hour.
0.	2. m.	2. m.	5-04	7-38	2. m.	2. m.	2. m.	5-33	8-21	2. m.
1.	10-15	12-54	15-36	18-24	11-11	14-04	17-00	20-00		
2.	21-16	24-15	27-22	30-36	23-05	26-15	29-31	32-55		
3.	34-00	37-34	41-19	45-16	36-32	40-05	43-53	47-51		
4.	49-26	53-50	58-27	63-17	51-58	56-15	60-42	65-20		
5.	68-20	73-34	78-57	84-27	70-03	74-55	79-53	84-55		
6.	90-00				90-00					

Horizontal Dial for Latitude 42°-25'.

Hours min.	Hours min.	Hours min.	Hours min.	Hours min.
0. 10 1-41	2 10 23-15	4 10 52-20		
20 3-22	20 25-16	20 55-20		
30 5-04	30 27-22	30 58-27		
40 6-47	40 29-30	40 61-39		
50 8-30	50 31-45	50 64-57		
1 00 10-15	3 00 34-00	5 00 68-20		
10 12-00	10 36-21	10 71-48		
20 13-48	20 38-47	20 75-21		
30 15-36	30 41-19	30 78-57		
40 17-27	40 43-56	40 82-36		
50 19-20	50 46-38	50 86-18		
2 00 21-16	4 00 49-26	5 00 90-00		

In Chamberlaynes present State of ~~England~~
of England, page 24 ec.

Averdue pois hath 16 Ounces to 1 pound, but
then of Ounce Averdue pois is lighter than 1 Ounce Troy by
42 Grains, in 180. [note 180 grains is an Ounce Troy & 15.666666666666666 grains is a Pound Troy] that is near a $\frac{1}{12}$ th part; so that the
Averdue pois Ounce containeth but 43.8 Grains, & is as 73 to 80
that is 73 ounces Troy is as much as 80 Ounces Averdue pois; and
6 pounds Averdue pois is equal to 73 pounds Troy: and 14 ounces
Troy & a half & a half part of a Troy Ounce, maketh 16 Ounces (or one
Pound) Averdue pois.

Page 18. In King Edw. of Thirds time; a Pound Sterling
was a Pound Troy weight, whereas now a Pound Sterling is but
4/3. part of a Pound Troy, and little more than a $\frac{1}{4}$ th part of
a Pound Averdue pois weight. Page 20. That 12 Ounces of pure
silver without any alloy, is worth £3-1-6, and an ounce is
worth £0-5-1-1. But with alloy is worth but £3, & 1 Ounce 5/-
So that now of proportion of Gold to Silver in England, is as
8 to 14 & about $\frac{1}{3}$ that is to say, one ounce of Gold is worth in Silver
14 ounces & about $\frac{1}{3}$ or £3-14-2 of English money.

Page 79. England, contains 725 Parishes; not allowing
to each Parish one with another 80 Families, there will be
778000 Families, & to each Family 7 Persons, there will be
found in all Fine millions four hundred forty six thousand
Souls, & amongst them about One million of fighting Men.

Page 97. The Year in England according to 9 cycles
of Sun & Moon, according to 9 Almudays, begins on the
first of January; but of English Church & State begins of year
from 25th Day of Christi Incarnation; or. on 25th of March;
(as is also observed in Spain; yet of Portugues & divers coun-
tries in Africa) begin of year but 29th of August, the Ve-
neration our first of March according to 9 Epochs of Greeks
only longest Day, as old Romans did on & shortest Day; w. two
last seem to have most reason, as beginning just at Periodic
day of Sun return.

The Natural Day consisting of 24 Hours, is begun in England
at Midnight, & counted by 12 hours to Midday, & again by 12

hours to next midnight; whereas in Italy, Bohemia, Poland, & some other Countries, they account from Sun setting by 24 of 12 clock to & next Sun setting; and at Nuremberg & Wittenberg in Germany, according to old Babylonian account they begin at & first hour after Sun rising to count one of the clock, & so again at & first hour after Sun set.

Page 99. The English (as all of western Christian till about 400 years ago) used only Numeral Letters in all writings; but since use of Figures 1, 2, 3, &c, which Christians learnt first of Moors or Arabs, & they of Indians. [Wrote in King Charles 2. time.]

Page 295: Speaking of & plenty of Kings Table before & troubles in Charles 2. time, says, through the whole body of the Kingdom was spent in the Kings house yearly of gross meat 1500 Oxen, 7000 Sheep, 1200 Veals, 300 Porkers, 400 Stunks or young Beefs, 6800 Lambs, 300 Fletchers of Bacon, & 20 Boars, Also 1140 Dosen of Geese, 240 Dosen of Capons, 470 Dosen of Hens, 750 dozen of Pulletts, 1470 dozen of Chicken. For Bread 3640 Bushels of Wheat; and for Drink 600 Tun of Wine, & 1700 Tun of Beer. Moreover of Butter 16640 pounds, together with Fish & Fowl, Venison, Fruitt, Spice proportionable.

Page 293. There were daily in his Court 86 Tables, well furnished each meal, whereof of Kings Table had 28 Dishes, the Queens 24, 4 other Tables 16 Dishes each, Three other 10 Dishes each, 12 other 7 Dishes each, 7 other 5 Dishes each, 3 other 4 each, 32 others 3 Dishes each, & 13 other had each 2 Dishes; in all about 500 Dishes each meal, with Bread, Beer, Wine, & all other things necessary.

Page 412. of Temporal Lords or Peers of Englane, there are at present about 170, whereof there are 10 Dukes, 3 Marquises, 68 Earls, 8 Viscounts, & 78 Barrons; whereas within 70 years last past there was not one Duke, but one Marquis, about 19 Earls, 3 or 4 Viscounts & 40 Lords. Note A Baron is the lowest Peer as a Duke is the highest, & a Baronet is the highest of the Estate or Commons, or of lower nobility & a Gentleman & lowest. all noblemen are Gentlemen tho' all Gentlemen are not noblemen.

Page 440, of & lower Nobility in England there are
Reckoned at present, above 700 Baronets, who are possessed
one with another of about £1200, a year in Lands. of
Knights above 1400, who one with another may have about
800 pounds Lands a year. of Esq^r & Gent. above 6000, each
one possess one with another about £400 a year in Lands.
Next to & lower degree of Nobility & first Degree of Commons
or Plebeians, are of Freeholders in England commonly
called Yeoman signifying in low Dutch Some Body. The
Yeomanry of England having Lands of their own to a good Value,
& living upon Husbandry, are lookt upon as not apt to commit
or omit anything that may endanger their Estates, or Credits,
nor apt to be corrupted or suborned &c. wherefore they are
judged fit to bear some offices or of Constables, Churchwardens,
to serve upon Juries, to be Train Soldiers, to Vote in Election
of Knights of Shire for Parliament &c. In Cases & Causes
the Law of England hath conceived a better opinion of
Yeomanry that occupie Lands, than of Tradesmen, Arti-
ficers or Labourers. Husbandry hath in no age renounced
a Gentleman Iognoble, nor uncapable of places of Honour.
The next are Apprentices, next Tradesmen, & first Foreign
Merchants, then whole Clergy, then Retailers, lastly me-
chanicks or handycraftsmen. These are all able to bear
some sway or office in Cities or Towns, Corporate. The lowest
Member of Fleet of F^r Bodie Politique, are of Day Labourers
tho^t by their wages, live better than of Husbandmen
do in many other Countreys.

The Second part. page 102 shew that Voted for Knights of
& Shire were to be Freeholders Reside in County & had yearly
Revenue 40%. which till discovery of Gold & Silver in
America, was as much as 30 or 40 pounds now. This act was
made by Hen. 6.

Page 120. and Lord Hough they give their Suffrages or
Votes beginning at & Justice or Count Baron, & so of next Ser-
vition, every one answering apart [content] or [not content]
and House of Commons they Vote by yeas and Noes altogether
& if it be Doubtfull whether be of greater number, then the
yeas are to go forth, & if not are to fit still, (because these are
Content)

Content with their present Condition, without any such addition or alteration of Laws as of other (as we have seen) have been appointed to number them; but at a Contest this it will be of whole House as is sometimes, the yeas go on one side, & the noes on the other, whereby they may be discerned.

Page 140. To the Lordes, Heires Belong 3 Dukes of Royal Blood, the one be infra statem, 7 other Dukes, 3 Marquises, 56 Earls, 9 Vicounts, and 67 Barons; in all 154. Then there are 2 Arch-Bishops & 26 Bishops: so that of total is 180. But many being under age, some Sick, abroad &c. of ordinary number is about 100. To the House of Commons Belong a little more than 500 [of which 513] persons, whereof commonly near 200 are absent upon Custome, Sicknes &c.

Page 285. In 1588, upon Expectation of Spanish Armado, stiled invincible, there went forth from Queen Comissions to muster in all parts of England all men that were of perfect force & limb, from the age of 16 to 60, except Noblemen, Clergymen, University Students, Lawyers, Officers, & such as had any Publick Charge, leaving only in every Parish so many Highlandmen as were sufficient to till the Ground. In all those musters there were then numbered three millions; but of them fit for War, about Six Hundred thousands. In another muster of Queen Elizabeth there were found in all England fit for War of Common Soldiers, about Four Hundred thousands, & of those Armed & Trained One Hundred Eighty five thousand besides Horse near forty thousand: and that of Nobility & Gentry were then able to bring into the field of their Servants & followers Twenty thousand men Horse & Foot, Choice men, & Excellent Horses; and all fit for war, & ready upon all occasions Six Hundred Forty two thousand, leaving sufficient to till the ground, and to furnish Troops, besides Nobility, Gentry &c.

Page 295. 2. part. The Royal Sovereign being a Ship of the first Rate or Rank, built in year 1637, is in Length by the Keel 127 feet, in Depth 49 feet, her Draught of water 21 feet: of Burthen in all 2072 Tuns, & 1554 Tuns besides Gun, Tackles &c. This mighty moving Castle hath Six anchors, whereof the biggest weighs 6000 lb, & the least 4300 lb. It hath 14 cables, whereof the greatest is 21 fathoms in compass, & weighs 9000 lb: her least cable being 8 fathoms in compass, weighing near 1300 lb. To the Royal Sovereign Belong 18 Masts & Yards, whereof the greatest

greatest, called of main Mast, is 175 feet long, her Main
Gard 97 feet long, & her ~~main~~ ^{2d} Maintop 15 feet Diameter: She hath 10 several sorts of Sails of several names,
(as every Ship of every one of 6 Rates hath) whereof her
greatest Sail called her Main Course (together with her
Bombar) contains 1640 yards of Canvas, which double,
& least Sail, called of fore top-gallant Sail, contains 130
yards of Canvas. The Charge of one compleat Suit of
Sails for a Sovereign is 404 pounds Sterling Money.
The weight of the Store in point of ground tackle &
other Corage is 60 Tuns 800 & odd pounds. She carries
a Long Boat of 50 feet, a Pinnace of 36 feet & a Skiff
of 27 feet long. The weight of Rigging is 33 Tuns.
She hath 3 Tire of guns all of Brass, whereof there
are 44 in her upper Tire, 34 in her 2d Tire & 22 in
her lower Tire, in all 100 Guns. She carries in all,
of Officers, Soldiers & Mariners 700 Men. Finally,
her whole Charges for Wages, Victuus, Ammunition,
wear & ~~tax~~ for every Month at Sea, costs of King
3500 pounds Sterling, the Charges of building a
Ship of first Rate, together with Guns, Tackles & Rigging,
(before Ventiling) doth ordinarily amount to about
26000 pounds, those of lower Rates proportionably.

Page 332. That we may better guess at the number of Inhabitants or humane Soles in this great City, he must know
that in one year there was computed to be eaten in London,
colonie was left by one 4th part, 67000 Beefs, 10 times as
many Sheep, besides abundance of Calves, Lamb, Veal,
all sorts of Poultry, Houl, Fish, Roots, milk &c, also that
Commonibus Armis to supply London with Newcastle
Cle, there is brought into the River of Thames 290000 Chal-
dron, & every Chaldron is 36 Bushels. Again the number
of Inhabitants may be guessed at by Burials & Births in
London, & in ordinary years when there is no Pestilence
amount of late to fifteen or 16 thousand in a year 3 times
more than in Amsterdam. There was in a year 1667
according to exact computation buried within the City of London

452563 Barrels of Strong Beer, at 12/6: and 580421
Barrels of Ale at 6/6. and 429797 Barrels of Table or
Small Beer at 6/6. The Beer Strong & Small is 36 Gal-
lons to 1 Barrell, & of Ale 32 Gallons. It is true that some
hereof is Transported beyond the sea, but that is scarce con-
siderable. The Excise only of Beer & Ale for the City of London
(the very moderate) is Drawn or Rented of the King at above
120000 pounds a year.

In Atkinsons Epitome of Art of Navigation.
Page 272 &c.

An easy & exact way to measure a Half minute Glass.

Let a Plumbmet of any form or Weight, be fastned to one
end of a Thread, or silk String that is 38 $\frac{1}{2}$ Inches long, &
at the other end is a Loop or Noose, to hang it on a small Pin
or Nail, fastned in any Place, so that the Plumbmet may
swing freely. Then the Loop of the String being hung on the
Pin, the String 38 $\frac{1}{2}$ Inches from the Center of Gravity to the
Center of Motion: that is 38 $\frac{1}{2}$ Inches from the end of the Loop,
to the middle of the Plumbmet; and the Plumbmet caused to swing,
each of those Swings shall be a true Second of time, and
30 of them the just length of a Half minute Glass. Always
counting the Swings both forward from, & backward to the Per-
pendicular, supposed to fall from the Pin whereon the String
doth hang: For Half a Second of Time is measured every
time the Plumbmet passeth from the Perpendicular to its
utmost swing both ways.

But when the Ship hath any Considerable motion make
the String 7 Quarters shorter, & there make a knot to hold it by
between your finger & Thumb, then by the motion of the Head,
cause the Plumbmet to swing to an angle of about 60 degrees
every Swing from the aforesaid Perpendicular; then each
Swing shall be equal to those beforementioned: So that by
this Experiment, you may measure a true Half minute
of time without a Glass, and by it examine the Truth
of any Glass.

Mr. Greenwood says the String must be 39,2 to vibrate 2s.

From Hamilton's new Account of East Indies, Vol. 2.

Page 131. Speaking of Rembang on the Island Java,
They have one dangerous little Animal called a Jackoa,
in Shape almost like a Lizard. It is very malicious, &
Piseth at every Thing that offendeth it, & wherever the
Liquor lights on an Animal Body, it presently cankers
the flesh, unless immediate Counterirings are used, & if
that cannot be had, the Piece must be cut out, for
if once it blisters the Skin, there is no Cure for it af-
terwards; but he seldom fails of giving notice where
he is, by a loud calling Jackoa.

I was once at Supper with some Dutch Gentlemen
at Rembang, in an House thatch with Cocoa-nut
Leaves, and we were not sooner set, but one of those
Jackoas opened his Throat almost over our Heads.
The Dutch Gentlemen took the Alarm, & arose from
the Table in great haste, & ran out of the Room, calling
to me, who sat still (not a little ~~surprised~~ to see
their sudden flight) to follow them, for my
Life was in danger, and, on hearing that Anno-
nition, I was not long after them, but its noise
spoiled our Supper.

As there are many species of wild Animals in those
woods, there is one in particular called the Oran Outong.
It is nearest to Humane, both in Shape & Sagacity, &
being all the ^{the} Head of Animals. I saw one about 4 Foot
high, gross Bodied, long Arms from the Shoulders to the
Elbows. His Fingers ends reacht just to his Knees, as
he stood upright. His Thighs & Legs plump, but too
small in proportion to his Body. His Feet long, and
broad at the Toes, but a little too narrow at the Heel. His
Belly prominent, covered with a light coloured Fur, the
rest of his Body being brown, & the Fur thicker & longer
than the Belly Fur. His Head somewhat large. His Face
broad & flat. His Eyes gray & small. His Nose little & flat.
His

His upper-Lip & under-Jaw very large. He blows his Nose, and throws away of Snot with his Fingers, can kindle a Fire, & blow it with his mouth. And I saw one Broil a Fish to eat with his boiled Rice. The Females have their regular Menstrua. They have no Tail, & walk upright. They are of a melancholly disposition, & have a grave dejected Countenance, and even when they are young, they are never inclined to play, as most other Animals are. There is a smaller sort, but of a different Species, called Umpaes; but their Legs & Arms are very small.

They have many large Crocodiles or Allegators in their Rivers & marshes, and sometimes they go a mile or two off to Sea, & get full of Fishers nets. I was Cleaning a Vessel (that I bought at Samavang) on a bed of Oore, had Stages fitted for my People to stand on, when Water came round the Vessel; and we were plagued with 5 or 6 Allegators which wanted to be on of Stage, & every Moment disturbed our Men, so I, & two of my men, set on the Vessels Deck, & fired 3 muskets at them, but our Ball did 'em no harm, for their hard Scaly Coat was shot proof. At last we contrived to shoot at their Eyes, & we shot at one so, as soon as he found himself wounded he turned Tail to us, & with great flourishes made to shore, about half a mile from us, & I rest following him we were pretty quiet after that. A Day or two after some Fishers told us, they had seen a dead Allegator on of Shore, & pointed whereabout, I went back a sea, a shore, and found him lying at full length: I measured his length, & found, from his Nose to his Tail 27 feet, & he was about one third part his length in circumference about his Belly.

Page 217. Speaking of Maccau a City built by the Portuguese in Canton or Quantung, in China, say, there is a largest Brass Cannon Mounted in Batteries about of City, I ever saw. I measured one (or weight many) out of Curiosity, & found it 23 feet from the

of Breech to of Muzzle Boing, 9 $\frac{1}{4}$ inches Diameter
in of Bore, & it was 12250 Rotulæs or lb weight of
Solid metal.

Page 235. Speaking of City Canton, in of Province
of Canton, he says, The People are Ingenuous, Civil
& Industrious, but are too Numerous, which makes them
tolerable a base & cruel Custom, that when a man
thinks he has too many Daughters he may destroy as
many as he pleases of them, but they do not kill them
outright, but serve them as slaves was in Egypt, by
laying them on an Ark of Reeds, & letting them float
on of Stream of a River, while they are infants, & if
any Charitable Persons see them, & Commissiate their
Condition, they may take them out, & bring them up as
their own, either for Marriage, Concubinage or
Slavery.

Page 238. He says, He made a Calculation of
Inhabitants within of Walls of Canton, by of quantity of
rice daily exp. ded in it, 100000 People being reckoned
of daily Import of it, & one Person is reckoned to consume
one Peck in 3 months, so by that Calculation there
must be above 2900000 People in it, & in of Suburbs
& third of that number & there is no Day in of year
but steers 5000 Sail of Trading Jonks, besides small
Boats for other Services, lying Before of City.

From of American Magazine for Novr 1793.

There are 220 of List of of House Peers, Dukes	- - -	27
Marquises, 5 English 1 Scot	- - -	2
Earls, 73 Eng. 14 Scots	- - -	87
Viscounts -	- - -	54
Barons - one Scot	- - -	68
Great Officers who precede Dukes	- - -	7
		205

For of Month of December.

There belongs to of Lower House 553, whereof 12 belongs
to Wales & 45 to Scotland.

From of American Magazine for Febt. 1745, taken
from of Present State of Great Britain.

The Royal Navy of England consists of 7 men of War of 100 Guns,
13 of 90, 16 of 80, 23 of 70, 19 of 60, 47 of 50 (that is 125 of the
Rate of Battle) besides 23 of 40, 9 of 30, & 25 of 20; in all 182.

The Charges of Building a Ship of First Rate, toge-
ther with of Guns, Fackle & Rigging (besides victualling)
will Ordinarily amount to about 60,000 Pounds: Those of
lower Rates proportionably.

To man of Royal Navy of Great Britain requires about
36,000 Marinets. In late Years there were actually
raised 40000 Men from Year to Year of Royal Navy,
and of First & Second Rates were scarce ever all of them
in Commission at once.

The Royal Sovereign
Built at Woolwich by Mr. Fisher Harding, Master
Shipwright of His Majesties Yards at Deptford, was launched
the 25th of July, 1705, & is of following Dimensions. The
Length of Taffarel to Head, 216 Foot. The Guns 110. The
Men, full Complement 1250. The Breadth 50 Foot. The
Tuns 2000. The full Tread, 158 Foot. The Draught of
Water, 22 Foot. The Cloathing 10,544 Yards. The Main-
Sail in Length 54 Yards. Tills in Depth 16 Foot 6 Inches.
The main Mast in Length 39 Yards. The Diameter of
D. 38 Inches. The Weight of the Anchor 82-3-14. The
Cable in Length 200 Yards. The Diameter of D. 22 Inches.

From of American Magazine for May 1745. Taken
from of Craftsman, Febt. 16. N^o 937.

We have now 6 Ships of first Rate, 100 Guns each, & 950 men
each; we have 16 Ships of second Rate, 90 Guns & 750 men
each; we have 59 third Rate Ships, 12 whereof are 80 Guns,
& 600 men, 23 of which are 70 Guns, & 480 men, & 24 of which
are 60 Guns, & 400 men; of fourth Rates, we have 35 of 50
Guns, & 300 men; there are 24 of fifth Rates, 16 of which have
44 Guns, & 250 men each; & 6 of which are of 40 Guns & 240 men
each; the Number of our sixth Rates is 22, one of which is of 24 Guns,
& 500 men, the rest have 22 Guns, & 130 men each. We have 19 Fire-
Ships, 9 Bomb Ketches, 2 Store Ships, 2 Hospital Ships, 16 Sloops & 7 Yachts.
In several Ports of the West Indies, belonging to us, we have now 19 Ships of War,
(exclusive of the preceding List) stationed. The Victory, Northumberland, the Coss
not reckoned. The 6 Rates 156, Fire Ships 50, Indept Indies 19; Total 225.

To Mankind

Urbanity & Civility are a Debt we owe

They found the soil to be very fertile;
& therefore they began to build dwelling
houses and houses of Public
Worship, and had many Pious
Ministers ~~to~~ to instruct them in
the way they should go; but yet
they were often molested by these
brutish Savages, but some of
them proved very Mild, and
Exchanged Necessary things;
and after they had erected

and 4

Xerxes the great did die & so must you

Many noble Structures, they
thought fit to build a Seminary;
and therefore they chose a Place
for that Purpose In Cambridge.
which is Now an Excellent College.

After ~~they~~ had continued here some
considerable time; and began to be
famous for trade; Old G. thought pro-
per to take ~~them~~ under ^{their} inspection
by laying imposing heavy Taxes upon
~~them~~. After The People had fer-
ved him a Considerable Time;

Remember thy creator in thy Youth.

To Remember one's Creator in Youth, so as to be
mindful of him in old Age, is truly commendable:
And is sufficient to cause every considerate and
moral Person to determine never to be ~~un~~mind-
ful of him, by whose Aid they have ~~been~~ ^{been}
fortified from innumerable Accidents, which
are incident to the human Race: therefore
to be unmindful of our Creator would be
ingratitude to the extreme, And
"Ingratitudo est Filia Diaboli." —

Therefore seeing we are under indispensible
Obligations to pay him our supreme Homage
let us not forget him especially in our youth-
ful Days; for if we forget him while in
our youthful Days; it is not probable that we
shall have any Recollection of him in old Age. —

Forsake Lying and love the truth.

It lie is an absurd vice; yet practis'd almost universally by the human race. Indeed there are some Cases in which ~~it ought not to~~ is not so reprehensible as in others; as for instance, when a Man falls into the hands of Savages, he is not to be blamed if he persuades them that he is of a Nation of which they stand in fear, and by that means saves his life. The Scripture itself says, The truth is not to be spoken at all times. But I would by no means justify a Vice which is so foolish & vain in General, and hardly ever advantageous.

Wisdom is better than Rubies.

Among all our pursuits in Life, Wisdom is to be ~~esteemed~~ ^{esteemed} the most useful: its Advantages are innumerable, its worth inestimable; in short its Perfection is more desirable than the most elegant Rubies.

It is by this that we are enabled to render Life in a Measure more agreeable by avoiding those Anxieties, which distract the Mind. The simple it is by this also, that we shun all vicious and ungodly Companions, being convinced of the tendency of this Conversation to corrupt our Morals; it is this also that points out to us that most important and inestimable U nit tion. Evangelicauor, which we are told by ancient writers is a divine Pre cept, and even Popi himself says, "This is the only makes our life below, and see our knowledge is our use to h ave."

Notes from Dr. Cotton Mathers Christian Philosopher. — — —

Essay 1st of Light
Page 11th Mr Romer, from his accurate Observations of Eclipses of Satellites of Jupiter, their Immersions & Emergencies, thinks he has demonstrated, that light requires one second of time to move 9000 miles. He shew^s that Rays of light require ten minutes of time to pass from the Sun to us. And yet Mr Huyghens hath shewⁿ, that a Bullet from a Cannon, without abating its first Velocity, would be 25 years passing from us to the Sun. So that the motion of Light is above a million times swifter than that of a Cannon Ball; yea we may carry Matter further &c. &c.

We suppose the Distance of the Sun from the Earth to be 12000 Diameters of the Earth, or suppose 10000, & Light goes 1000 Diameters in a minute; so is at least 130000 miles in a second. Dr Cheyne shew^s that Light is about six thousand times more swift than Sound. A marvellous Velocity! To chequer his surprise at so swift a motion, I may propone one that shall be as very surprisingly slow. See affirms & Cardan together saw an Instrument, in which was one wheel continually moving with the rest & yet would not finish its revolution under the space of seven thousand years.

It is easy to conceive with Stevinus, an Engine with 12 wheels & a handle of such an Engine to be turned about 9000 times in an hour (which is as often as a man's pulse does beat) yet in 10 years time of Weight at the bottom would not move near so much as an Hair's breadth: And as Mercatorius notes, it could not pass an inch in 5,000,000 years; although it be all the while in motion, & have not stood still one moment.

Essay 2nd of Stars.

Page 17th Telescopes invented & beginning of last century. They are come to be 80 feet long.

Page 18th According to Mr. Hugens, if Distance of Sun from us is 12,000 Diameters off Earth. A Diameter off Earth is 7,846 Miles. The Distance of the nearest fixed Star from us. Compared with that of Sun, is as 27,684 to 1: So then off Distance of nearest fixed Stars is at Least 2,904,520, 923,000 Miles; which is so great, that if a Cannon-Ball (going all of way wth the same velocity it has when it parts with the mouth of a Gun) would scarce arrive of it in 700,000 Years. Great God, what is thy Immensity!

Essay 3^d Of the Fixed Stars. Page 21st Then we in yth Globe approach nearer to them, some 24,000 Diameters off Earth, or 188,304,000 Miles, one time off Year than another; yet their Parallax is hardly sensible, or any at all: it could not be if off Distance were not wonderfull.

Essay 4th of the Sun. Page 27th The apparent Diam^r of Sun being sensibly greater in ~~the winter~~ December than in June, it is plain, & observation Confirms it, that Sun is proportionately nearer to Earth in Winter than in Summer. It is also confirmed, by Earth's Moving swifter in December than in June; wth it doth about five Fifteenths. And for the Reason of it are about 8 Days more from Sun's vernal Equinox to Sun's Autumnal, than from Sun's Autumnal to Sun's vernal.

According to Cassini off Sun's mean Distance from Earth is 22,000 Semidiameters off Earth. And off Sun's Diameter is equal to 100 Diam. of Earth: And therefore off Body of Sun must be 1,000,000 times greater than off Earth. Cassini more directly expresseth himself; that off Sun's Distance from Earth is 172,800,000 Eng. Miles.

Page 30th The Diam^r of Earth is near 8,000 Miles, & off Diam^r of orbis magnus ten thousand Diam^r of Earth. This orbis magnus, or off Orbit of Earth, in its natural Revolution about off Sun, Mr. Gregor makes off Semidiameter of it 99,696,969 Eng. Miles; wth is off Diam^r of Earth from Sun. All Astronomers before Kepler supposed off Orbit a perfect Circle; but he has provided an Ellipse.

Essay 9th Of Mercury. Page 39th But let us now entertain our selves with a Synopsis, of certain matters relating to of Planets, as ~~as~~ are determined by of latest and most accurate Astronomers.

The Distance from the Sun in Eng. Miles.

Of Mercury -	Miles 32,000,000
Venus -	59,000,000
The Earth -	81,000,000
Mars -	123,000,000
Jupiter -	424,000,000
Saturn -	777,000,000

The Diameter in English miles.

Of Mercury -	mi. 4,240
Venus -	7,906
The Earth -	7,935
Mars -	4,444
Jupiter -	81,155
Saturn -	67,870
The Sun -	763,460

The Time of Periodick Revolution.

	Days	Hours
Of Mercury -	87	21
Venus -	224	17
The Earth -	365	06
Mars -	686	23
Jupiter -	4,332	12
Saturn -	10,759	07

Page 45th A comet would return to us from of Fixed Stars in 50 those fixed years, nor a Comet return in a much longer time.

Dr. W.

Dr. W.

Essay 17th Of y^e Air. Page 66.

Gallions found of water could not be raised by Pumping ~~up~~ any higher than 34 or 35 feet.

Mr. Boyle found by Repeated Experiments, that y^e Weight of air to Water is as 1 to 1000.

If a y^e Superficies of a Man's Body Contains 15 square feet, it is pretty near y^e truth, he would sustain a Weight equal to 39,900 pounds Troy, in a space of 13 fms. The Difference between y^e greatest & y^e least Pressure of y^e air upon our Bodys, is equal to 3982 pounds Troy. No^o Wonder y^e we suffer in our Health by Change of Weather.

Essay 18. Of y^e Wind. Page 71. The Inquisitive & Ingenious Mr. Derham found by many Trials, That y^e Wind in a great Storm doe move about 50 or 60 miles in an Hour. That a Common brisk Wind moves about 15 miles an Hour. But so gentle is y^e course of many Winds, that they do not exceed one mile an Hour.

Dr Grew observes, That y^e are Winds (besides y^e Trade Winds) especially from y^e West, do blow sometime 2 or 3 days upon one Point, & will in y^e time drive before y^e a ship 150 Leagues, or 450 Eng. miles.

Essay 19. Of y^e Terraqueous Globe. Page 78. Our Globe is nearer to y^e Sun in December than in June. The Sun's Apparent Diameter is greater than, & our Globe then has a swifter motion by a 25th Part. The Colder & more Northern parts of our Globe are indeed brought some Hundreds of Thousand miles nearer y^e Sun in Winter than in Summer.

Essay 21. Of Gravity. Page 83. According to y^e exquisite Halley & Huygens, the descent of heavy Bodys is after y^e Rule of about 16 foot in one $\frac{1}{20}$ of Time. Nevertheless Power increase as you descend & decrease as you ascend from y^e Center of y^e Globe, & that in proportion of the square of y^e Distance therefrom Reciprocally, so as for instance

at a Double Distance to have but a quarter of $\frac{1}{4}$ force.
A Tun Weight on $\frac{1}{4}$ Surface of $\frac{1}{4}$ Earth, Raized Heavenwards
unto $\frac{1}{4}$ Height of on Semidiameter of $\frac{1}{4}$ Earth from hence,
would Weigh but one Quarter of a Tun. At three Semi-
diameters ^{from & surface} of $\frac{1}{4}$ Earth, it would be as easy for a man to carry a
Tun, as here to carry little more than 100 pounds. At $\frac{1}{4}$ Dist.
of $\frac{1}{4}$ Moon is suppose to be 60 Semidiameters of $\frac{1}{4}$ Earth, 3600
pounds weigh but one pound; & $\frac{1}{4}$ fall of Bodys is but 16 foot
in a whole minute. Page 39. Mr. Keil shews, that $\frac{1}{4}$
Force of Gravity to $\frac{1}{4}$ Centrifugal Force, in a Body placed at $\frac{1}{4}$
Equator of our Globe, is as 289 to 1; so that by $\frac{1}{4}$ Centrifugal Force
arising by $\frac{1}{4}$ Earth's Rotation, any Body placed in $\frac{1}{4}$ Equator
looses a 289th part of $\frac{1}{4}$ Weight it would have if $\frac{1}{4}$ Globe were
at Rest. And since there is no Centrifugal force at $\frac{1}{4}$ Poles,
a Body there weighs 289 pounds, which at $\frac{1}{4}$ Equator would weigh
but $\frac{1}{289}$. On our Globe $\frac{1}{4}$ Decrease of Gravity, in going from $\frac{1}{4}$
Poles towards $\frac{1}{4}$ Equator, is always as $\frac{1}{4}$ Square of $\frac{1}{4}$ Co-sine of $\frac{1}{4}$
Latitude.

Essay 22. Of Water. Page 88. Pure Water is a fluid
void of all Vapor, & seems to consist of small, smooth, round
& porous Particles, that are of equal Diameters & equal Gra-
vities. There are also between them Spaces, that are so large,
& Ranged in such a manner, as to be on all sides pervious.
Their smoothness accounts for their sliding easily over the
Surfaces of one another. Their Roundness keeps them from
touching one another in more Points than one. So great
is their Porosity, that there is at least Forty times as much
Space as matter in Water. For Water is 19 times spe-
cifically lighter than Gold; but Gold will by Pressure
let Water thro' its pores, & has doubtless more pores than
Solid ~~matter~~ parts.

Page 91. According to Mr. Halley's Experiment, Water as
warm as stir in $\frac{1}{4}$ Summer, will in 12 Hours Exhale $\frac{1}{4}$ part
of an Inch. This Quantity will be found abundantly sufficient
for all $\frac{1}{4}$ Rains, & all $\frac{1}{4}$ Dew, & all $\frac{1}{4}$ Springs in $\frac{1}{4}$ World; and will
account for $\frac{1}{4}$ Caspian Sea, & our vast Canadian Lakes, being
altogether

Always at a Stand; and for a Current it always to Set in
of Streights of Gibraltar, the Mediterranean Sea receive
so many Rivers. Every 10 Square Inches of the Surface of the
Water, yields in Vapour per diem [we allow it only for the
time the Sun is up] a Cube Inch of Water. Every mile
will yield 69 1/4 Tons. At a Square Degree of 69 English miles
will yield 33 millions of Tons. If the Mediterranean Sea be
Estimated at 40 deg. long. & 4 broad, it is at least, the whole Me-
diterranean must loose in vapours in a summer's day at least
5 280 millions of Tons. And yet sometimes the Wind lifts up the
Surface of Water faster than it Exhales, by the heat of the Sun.
The Mediterranean Sea Receives nine Considerable Rivers,
We will suppose each of them to bring down 20 times as much
water as the River Thames, which do not; But we will allow for
the Small Rivulets. The Thames allowing of Water to Run
after the Rate of two miles an hour, may yield 20,300,000 Tons
per diem. Allow as before & all the Rivers bring down 1827
millions of Tons in a day. This is but a little more than a
Third part of what is proved to be evaporated out of the Mediterra-
nean in 12 Hours time. Page 94. The Danube in a sober
Account, as Bohun computes, runs 15 hundred Miles from its Rise
to its fall. The Nile according to Varenius, allowing for Curvatures,
runs 3000 Miles; & the Niger 2400; the Ganges 12 hundred; the Am-
azonian above 13 hundred Spanish Leagues.

Essay 24. of Magnetism. Page 105. It was Roger Bacon who first of all discovered the Virtue of the Magnet, or of its Property of Pointing towards the Pole, about 400 years ago. The Communication of its virtue to Iron was first of all discovered by the Italians. So it first ~~first~~ ^{first} lighted upon the use of the Mariner's Compass about A.C. 1300. After this of various declination of the Needle under different meridians, was discovered by Cabot & Norman. And then of variation of the declination, so as not to be always the same in one & the same place, by Hevelius, Aurot, Volckamer & others. The Inquisitive Mr. Derham says the Variation of Variation was first found out by our Gillibrand A.C. 1634.

Essay 26. Of Vegetables. Page 135. The Persuasion
in mankind how good of Tobacco being good for us, has in
a surprising manner prevailed! What incredible Millions have
Sucked in an opinion, that it is an usefull as well as a plea-
sant thing, for them to spend much of their time in drawing
thru' a Pipe of Smoke of yt lighted Weed! It was in y^e year
1585, that one Mr. Lane carried over from Virginia some To-
bacco, w^{ch} was y^e first yt had ever been seen in Europe; & within an
100 years of smoking of it grew so much in fashion, that y^e very Cus-
tomers of it brought 400,000 pounds a year into y^e English Treasury.

Essay 27. Of Insects. Page 158. Lately in my
Neighbourhood a poor man reaching to Vorith, a monstrous
Worm thrust up one end of its self, w^{ch} y^e man scared on,
fell to pulling of it, as a Fisherman hales up his Line,
& pulled till y^e Worm lay in an enormous heap; whence
being drawn into its length & measured, y^e Worm, in y^e
full Extent of it, made about ~~one~~ ^{long} ~~Hundred & Fifty~~ Foot

Essay 32. of Man. Page 223. The erect Posture of
Man, & his Sublime, how Conducious for a Rational Creature
who must have Dominion over those that are not so, & must
Invent & Practice things usefull & Curious! By this Posture man
has y^e use of his Hands, w^{ch} as Galen observes, are, Organa Sapien-
ti Animali Convenientia; and his Eyes, w^{ch} as they have the
Glorious Hemisphere of y^e Heavens above him, so they have y^e
Horizon of 3 miles on a Perfect Globe about him, when they
are Six foot High, & by y^e Refractions of y^e Atmosphere they
have much more than so. Page 230. The Bones in a Skele-
ton are 245, Besides y^e Osseja Setamoidae, w^{ch} are 18. The Muscles
of y^e Body are 446. The Nerves w^{ch} come immediately out of y^e
Skull from y^e medulla Oblongata, are Ten pair. The Nerves w^{ch}
come out between y^e Vertebrae, are 30 pair. Page 248. Dr.
Willis tells of one who had a Servant who was a Drummer, on
purpose that his deaf Wife might hear his Discourses, which
while y^e Drum was Beating, she was able to do.

Page 249. The Biggest Bell in Europe is Reckoned to be at Erfurt in Germany, is may be Heard, they say, 24 miles. Page 250 Clæus Magnus describes a Cane in Sicilie, into which a Dog or any other Animal be cast, it sends forth so dreadfull a Sound as to knock down every one that is near it; and they have therefore guarded it with high Walls to prevent such a mischief. Peter Martyr informs us of a Cane in Hispaniola with a small Weight cast into it, will with its hideous noise at 5 miles distance endanger Deafness. There are several other Instances of like nature in Galanee Page. Page 251.

Divers at the Bottom of the Sea can hear noises made above, but Confusely; those above cannot hear of Divers ^{below} at all.

Dr Hearn tells of Guns fired at Stockholm, so were heard an 180 English miles. In the Dutch War, Guns were heard above 200 miles.

Celebrated Authors differ about the Velocity of Sounds. Mr Verhulm has by nice Experiment determined, that there is a small difference in Sounds before & with & against it, & this a little abated or augmented, according to the Strength of the wind; but nothing else in the Wind will affect it: & there is one motion to all kind of Sounds, whether Loud or Low; & they all fly equal Spaces in equal times; & lastly the mean of their flight is at the Rate of a mile in $9\frac{1}{4}$ half Seconds, or 1542 Feet in one Second of Time.

That is 13 miles waiting
124 feet in a minute

Page 265. In Fine the Heart is a Compound Muscle, & each ventricle of it will (as Dr Hail observes) contain an ounce of Blood. We may well suppose the Heart throws into the Aorta an ounce of Blood every time it Contracts; the Heart Contracts 9000 times in one Hour. Sometimes more, Sometimes less; hence their passes thro' the Heart every hour 9000 ounces of Blood, that is to say, 350 pounds. Now the whole mass of Blood is no more than 25 pounds, so that a quantity of Blood equal to the whole mass passes thro' the Heart 14 times in one Hour; & it is about once in every 4 minutes; not the whole mass itself; we don't suppose that the Blood which goes to the Extremities, can return to the Heart as soon as it goes, for it goes only to the Kidneys or Liver.

Page 267. The Operation of the Stomach is mightily Resembled by

the

The Digestor of Monsieur Papin; in this if Meat is put together with so much water as exactly fills the Engine, the Lid is then screwed on so close as to admit of no external Air, & with two or three Lighted Charcoal, or of Flame of a Lamp, it is Reduced into a perfect Pulp, or indeed a liquor, in a very few minutes, in 6, or 8, or 10, or 12, or 16, according to the Toughness of the matter to be digested, or of Augmentation of the little fire; this way even of hardest bones are presently dissolved.

Page 275. The Blood for the Body of Man bears of Proportion to his Weight, of one to Ten; in other Animals 'tis but one to Twenty. And for the fetching of Spirits out of this Matter, there is of Laboratory of the Brain, as in a Man is twice as much as in a Beast four times as big.

Page 286. Homers Iliads have 31670, ^{verses} his Odysseys no less; and yet of younger Scalliger committed all Homer to his memory in 21 Days.

Page 289. But then there is another thing wherein of Supervintendence of the Glorious Creator & Goverour of the world is most Conspicuous; & that is, the Progress in the Invention of Men has made things of Greater use wth sooner invented things of a lesser use later; every thing in the time wth in our Great God has had his excellent purpose to be served with it; things equally plain with such as have been for merly Discovered, & as much desired, have been lock'd up from Humane understanding, till of God, in whose hand are our times, is pleased wthly to make them understood by the Children of Men. Why must Printing be withheld from the Service of Mankind till the year 1430, wth the first book of Printed Books was by the hand of Lan^rance Roster midwifed into the world, & the Skill immediately improved by Faust & Schoffer? Why must Mankind have no Telescopes till the year 1569, wth one whom Tyturus would suspect al most an Angel in the Shape of a Dutchman, Instructed Zippurje in Middleburgh to proceed upon you? We will pass to another instance. The Romans had not so much as a Sun-Dial till the 2^d Punic War, & when they had one, they had no more than that one, in the Forum, above an 100 Years, the King says it never went Right in all this time. Our King Alfred had no better Shift than this for Measuring his Woods.

The Burning of a Candle, marked into 12 parts, for as a Lanthorn was needfull to secure it from the wind off Windows, for Glaring was not yet in Fashion. Dr Grew observes, the first Concoit is tended to a Watch, was a Draw-well; first, People found the Drawing of Water with a Hand-cord & a Pitcher troublesome, so they thought of Draught-wheel; by & by they conceived such a movement applicable to a Spur, if the motion off Weight could be made slow enough, this was done by adding more Wheels, & a Flyer, which made a Jack: by & by men began to see, that if the motion w^t yet slower, it would serve to measure Time also, then instead of a Flyer they put a Ballance, & thus made a Clock; this being so useful, men considered how it might be made Portable, by something answerable to a Weight, & so instead of that they put a Spring & a Tuse-wheel, to make a Watch. Here is the pedigree of the noble Engine. But to what an astonishing Perfection is Clock-work, & Watch-work now arrived! At length Mr. Huygens has invented a way of applying Pendulums to watch-work. — The first of it was made in England was in the year 1662. The uses of these Pendulum-Watches cannot be sufficiently celebrated.

Page 291. of Mathematics is having of two last Centuries had such wonderfull improvements, do for 200 years more improve in proportion to the former, who can tell what mankind may come to! We believe, without having Seneca our Author for it, multa venientia avi populus ignota nobis fieri. [many things unknown to us will become understood by the people of next age].

Page 217. The Account of honest Legual gives of the Solitary Bird, as he & his Companions observed on the Isle of Rodrigo, is as admirable as unquestionable; The Bird has Wings, but so small that it cannot fly with them, they serve to flutter with a mighty Noise w^t they call one another; they never lay but one Egg, w^t is bigger than that of a Goose; the Male & Female set upon it in their turns, & all while they are hatching it, or bringing it to provide for its self, (as is divers Months) they will not suffer any other Bird of their own Species to come within 200 yards round of the place: But this is very singular, the males will never

Never drive away y^e Approaching Females, but call
for y^e own Females to do it; the Female does y^e like, and
upon y^e approach of any other Males, call y^e own Males
to chase y^e away. After these Birds have raised
their Young one, & left it to its self, we have often
observed (says my ingenious Traveller) that some days
after y^e young one leaves y^e nest, a Company of 30 or 40
Bring another Young one to it, & y^e new Sledged Bird, with
its Father & Mother joining with y^e band, march to some
by-place; we frequently followed them, & found that after-
wards, y^e old ones went each their way alone, or in couples,
& left y^e young ones together, which we called a marriage.
My Religious Traveller does give all possible Assurance
for y^e Truth of this Relation, & adds, I could not forbear
to entertain my mind with several Reflections on this
Occasion. I sent Mankind to Learn of y^e Beasts. —

Essay 31. of Four footed. Page 200. There is one very
odd Anomale, w^{ch} has but 3 Claws on each of his Four Feet,
& has a Name sake too often among them that go not upon Four,
'tis y^e Gymnopus, a Sloth we call it: he takes 8 or 9 minutes to
move one of his Feet 3 or 4 inches; & when he has grown fat
& plump with eating all y^e Leaves on a Tree, he will be
Skin & Bone before he reach another, w^{ch} will be fine
or Six days, tho' it may be very near y^e former.

Essay 27. of Insects. Page 142. Even y^e poor Ephemeron
whose whole Period of Life is but 6 or 7 hours, who is bred
& born, & lives, & goes thro' all his Operations, & Expires,
& goes into his grave, all within this little Period, must
not be thrown into a Class of Imperfect Animals; nor
may it be d^r of it, that it is made in vain. —

Notes from M^r Will^l Leybourn's Pleasure with Profit, or Recreations Numerical, Geometrical, Mechanical, Statical, Astronomical, Horometrical, Cryptographical, Magnetical, Automatrical, Chymical & Historical.

Out of the Statical part.

The Worth of Gold.

one	Pound Troy	L. £. d.
one	ounce	40-00-0
one	Penny weight	3-06-8
	Grain	0-03-4
		0-00-1 $\frac{1}{2}$

This is the Price of Ordinary Gold: Angel Gold is worth somewhat more; and Sovereign Gold somewhat less.

The Worth of Silver.

one	Pound Weight	L. £. d. %
one	ounce	3-0-0-0
one	Penny weight	0-5-0-0
	Grain	0-0-3-0
		0-0-0-0 $\frac{1}{2}$

But of English Coin,

of	Gold	one pound	L. £. d. %
	Silvers	Troy is worth	40-18-4-3

of	Gold	one Pound	L. £. d. %
	Silvers	Auendupires	3-02-9-0

Of the Weight of Water, & other things, in Weight & Magnitude.

one ounce	Troy	of Water Contains	1,8949	g
	Auendupire		1,72556	grches.
one ounce	Troy	of Water Contains	0,001096	Feet
	Auendupire		0,000998595	

One Pound ^{Troy} of Water is of 22,7368} inches.
 Avoirdupois Solid Measure 27,609 }

One Pound ^{Troy} of Water is of 0,013158} Foot.
 Avoirdupois Solid Measure 0,115917 }

A Cubical Foot of Water Weigheth of Troy Weight
 912 Ounces; & is 76 lb. Troy.

A Cubical foot of Water weigheth of Avoirdupois Weight
 999,463 Ounces; which is 62,588 lb. That is $62\frac{3}{9}-6\frac{1}{2}$.

The Proportion of Avoirdupois Weight to Troy is as 80 to 73.
 The Troy being $\frac{73}{80}$ of Avoirdupois. Or in decimals
 as 1.0800 to 9125.

The Proportion of Weight of Several Metals
 of same magnitude; supposing a Sphere of
 Gold to weigh a pound then of other Spheres of same
 magnitude will weigh as follows, not being less than
 a grain, Troy weight.

			Gold Water
	lb.	gr.	lb.
Gold	12 - 00 - 00	a Cubick Inch in 9,91735	9,33962
Quicksil.	8 - 11 - 10	air Weighs	7,93388
Lead	7 - 05 - 06		6,16198
Silver	6 - 10 - 12		5,50083
Bronz	5 - 13 - 16	- Copper	4,81342
Iron	5 - 01 - 01	Hammered	4,27715
Tin	4 - 13 - 11		3,96694
		Cast Iron	3,96821
			3,29048

By Weighing of overflowing Water when an Ir-
 regular Body is put therein, the Content of the Body
 may be known

Out of 3 Numerical part.

The Single Rule of Three Direct, is wⁿ 3 Num^{rs} are given & a 4th is demanded, is bears of same proportion to 3^d as 3^d bears to 1st.

The Single Rule of Three Inverse, is wⁿ 3^d are 3 Num^{rs} given, & a 4th Required to shall Bear of same proportion to 3^d, as 3^d doth to 1st.

A Table of Changes is made by Multiplying every Number from 1 to 100 successively into each others Product, unto 3rd of Units, assigned. Thus,

1	1	7	5040	And of 24 th being 3 rd of
2	2	8	40320	letters in the Alphabet will
3	6	9	362880	be 620,448,401,733,239,439,360,000.
4	24	10	3628800	
5	120	11	39916800	And so many words may be
6	720	12	479001600	made by 24 letters, if
		8c		Change of a letter in a word will make a new word, is is sufficient

for many more than all of Languages in the world. Mr. Leybourn says of all of Books, of might be made by words composed off alphabet & not write of same twice, would be a Decouple Covering for the whole Earth. The same may be done of numbers by 9 digits & cyphers.

In 3^d Autometical part. A Pendulum of 3 feet.

3, 2 inches may be called a universal measure, & is the length of a Pendulum of will swing 3 seconds every vibration: with caution & Rule, As the length of a String from a point of Suspension to the Center of a Round Ball, is to the Radius, so is Radius to a 4th number, like, of that 4th number to be added to the former length for the length of Pendulum.

The length of two Pendulums are in proportion to the squares of their several vibration, & will be equal to the Beats of Balance: therefore the Beats that shall be proposed in a minute being 90; & it being demanded to give the length of a Pendulum; The Analogy is, As the square of 90 vibrato is to the square of 60 vibrato, so is 39,2 to 26,4 the length Required. and

And if \mathcal{L} Length be given to find \mathcal{S} Swings or Beats in a minute, The Analogy is, As \mathcal{L} Altitude given, to \mathcal{L} Altitude known, so is \mathcal{S} Square of \mathcal{V} Vibrations known, to \mathcal{S} Square of \mathcal{V} Vibrations Required. The Square Root whereof is \mathcal{L} Answer. And because \mathcal{L} Middle Terms stand in all such Questions, & will be always 141120; therefore divide 141120 by \mathcal{S} Square of \mathcal{V} Swings in a minute, it gives \mathcal{L} Length sought, or by \mathcal{L} length it gives \mathcal{S} Square of \mathcal{V} Swings. And thus a swing may be hanged by any Clock, upon a Pin, so that it may freely vibrate to regulate \mathcal{V} same Clock. The altering of \mathcal{L} Pendulum by Raising or Lowering it to of an Inch will make \mathcal{V} Clock go faster or slower 1 minute 25 seconds in a day. (Supposing \mathcal{L} Pendulum to swing Seconds) $\frac{2}{10} 3-36. \frac{3}{10} 5-31$ to $3-26 \frac{5}{10} 9-21$ in a day.

A Note Concerning Time: That is Ordinarily called \mathcal{L} Hour of \mathcal{V} Day. You are to Consider this in \mathcal{L} Length of Days, which are two fold, Distinguished only by \mathcal{V} Revolution of Earth or Sun. The first is \mathcal{V} Syderial Day, where any fixed Point or Points of \mathcal{V} Earth in \mathcal{V} same Meridian or Azimuth Returns from any Star to \mathcal{V} same again. The Second is \mathcal{V} Solar Day, where \mathcal{V} same Meridian of \mathcal{V} Earth Returns from \mathcal{V} Sun to \mathcal{V} same again. Neither of these are \mathcal{V} true Equinoctial Day. Indeed \mathcal{V} Syderial is Inseparably of same, if it be but for some small space of time, \mathcal{V} difference being only some $\frac{1}{4}$ to $\frac{1}{5}$ of a degree slower in a day; but \mathcal{V} Solar is notably longer than \mathcal{V} other, viz by $3-46-53-19$ of time in a day; And from hence \mathcal{L} Length of an Hour is generally accounted. If by a Curious Observation of a Fixed Star Revolving to \mathcal{V} same Point again if watch or Clock wants 3 minutes 43 sec off time it goeth true to \mathcal{V} Equal or middle motion of \mathcal{V} Sun, otherwise not. If a Sun Dial be made never so exact to the Motion of \mathcal{V} Clock so too, yet there will be a Considerable difference after some Days, nay even in one Day: all to fall out by Reason of \mathcal{V} Inequality of Natural Days. This Inequality is

settled in \mathcal{V} following Table. Admit my first of Feb. I would set a Clock to \mathcal{V} hour of equal time of \mathcal{V} Day, & looking following Table against Table 1, At \mathcal{L} 5-9 find 14 min 43 sec with dials, watch too fast, is Inform me, That I must set my Clock so much faster than \mathcal{V} time given by a Sun Dial, & for being kept going it will be by \mathcal{V} first of March but 10 min too fast, & on Apr. 8th of Clock & Sun will agree together exactly, afterwards, \mathcal{V} Clock will begin to be slower, & when \mathcal{V} Sun will agree together again, & knowing \mathcal{V} equal time you may know \mathcal{V} time apparent time, by Substracting \mathcal{V} day in question, wch the watch too fast, & adding it when the watch too slow, out of time given by \mathcal{V} Clock.

24 Table of Equation of Time, for Regulating of Clocks & Watches

Jan.	Febr.	Mar.	Apr.	May	June	July	Aug.	Sept.	Octbr.	Nov.	Dec.																			
Pl. 3.	m. 3.	m. 3.	m. 3.	m. 3.	m. 3.	m. 3.	m. 3.	m. 3.	m. 3.	m. 3.	m. 3.																			
1 9-4 14-48 10-04 0-45 4-10 1-02 4-45 4-28 3-53 13-16 15-21 5-25	2 9-26 14-46 9-47 0-20 4-11 0-80 4-53 4-18 4-14 13-32 15-13 5-06	3 9-48 14-44 9-30 0-12 4-12 0-37 5-00 4-08 4-34 13-46 15-03 4-38	4 10-10 14-41 9-13 0-03 4-13 0-23 5-03 3-57 4-55 13-59 14-53 4-09	5 10-31 14-37 8-55 0-18 4-12 0-13 5-13 3-16 5-15 14-11 14-41 3-40	6 10-50 14-32 8-37 0-33 4-11 0-00 5-18 3-23 5-36 14-23 14-29 3-10	7 11-9 14-27 8-19 0-18 4-10 0-13 5-24 3-21 5-56 14-34 14-17 2-40	8 11-27 14-21 8-01 1-02 4-08 0-26 5-29 3-08 6-17 14-44 14-03 2-10	9 11-45 14-15 7-43 1-16 4-06 0-39 5-33 2-55 6-38 14-54 13-49 1-10	10 12-02 14-07 7-25 1-28 4-03 0-52 5-36 2-16 6-58 15-04 13-34 1-11	11 12-18 13-59 7-00 1-41 4-00 1-04 5-39 2-17 7-19 15-13 13-17 0-11	12 12-34 13-50 6-47 1-54 3-56 1-07 5-92 2-13 7-39 15-22 13-00 0-11	13 12-47 13-41 6-28 2-06 3-41 1-30 5-14 1-58 7-59 15-22 12-43 0-19	14 13-02 13-31 6-00 2-16 3-46 1-43 5-45 1-42 8-19 15-31 12-24 0-10	15 13-15 13-21 5-51 2-27 3-10 1-56 5-46 1-26 8-38 15-40 12-05 1-19	16 13-27 13-10 5-32 2-38 3-34 2-08 5-16 1-09 8-58 15-45 11-45 1-19	17 13-38 12-59 5-14 2-48 3-28 2-20 5-15 0-52 7-18 15-50 11-25 2-18	18 13-48 12-47 4-55 2-55 3-21 2-32 5-44 0-35 7-37 15-53 11-04 2-41	19 13-58 12-35 4-36 3-06 3-13 2-44 5-42 0-17 9-57 15-45 10-42 3-16	20 14-07 12-22 4-17 3-14 3-05 2-56 5-40 0-01 10-16 15-58 10-26 3-45	21 14-15 12-08 3-58 3-22 2-56 3-07 5-38 0-18 10-39 15-59 9-56 1-14	22 14-22 11-59 3-40 3-30 2-48 3-19 5-31 0-36 10-52 16-01 9-32 1-42	23 14-48 11-49 3-22 3-37 2-39 3-30 5-30 0-55 11-19 16-00 9-08 5-29	24 14-34 11-24 3-03 3-43 2-29 3-41 5-26 1-14 11-28 15-59 8-43 5-36	25 14-38 11-09 2-45 3-39 2-19 3-51 5-20 1-34 11-45 15-57 8-17 6-04	26 14-42 10-51 2-26 3-53 2-09 4-01 5-19 1-53 12-02 15-55 7-51 6-30	27 14-45 10-38 2-09 3-57 1-59 4-11 5-08 2-12 12-18 15-51 7-23 6-57	28 14-47 10-21 1-51 4-01 4-18 4-20 5-02 2-32 12-33 15-47 6-59 7-23	29 14-48 1-34 4-04 1-37 4-29 4-54 2-52 12-39 15-41 6-31 7-48	30 14-49 1-17 4-07 1-25 4-37 4-16 3-13 13-04 15-35 6-03 8-12	31 14-09 1-01 1-14 4-37 3-33 15-27 8-35

In & Mechanical part. Of Walking or Flying Automata.
Of this kind were Vulcan's Tripodes, Celebrated by Homer, that
w. made to move up & down of Hough; & fight with one another.

Cardan makes mention of an Image holding in its hand a Golden
apple, Certified with many Costly Jewels, w. if a man Offered
to take, & Statue presently shot him to death; & touching of w
apple Serving to discharge Several Bows, or other like Instru-
ments couched in & Body of of Image.

Regiomontanus made a wooden Eagle & an iron Fly.

Magnificent works. St. Paul's Steeple at London (w. w. Spire
was on it w. was fired by Lightning Anno 1553) the Stone work
was 260 foot high & Spire as much w. was 420 foot in all.

The Steeple at Cremonia in Italy, is 428 foot high.

The Bell upon St. Peters in Rome, is 466 feet.

The Highest of of Pyramids, 1350 Feet.

The lowest of of Pyramids 883 feet.

Boston Steeple in Lincolshire all of Stone & without any
Spire, is 264 feet.

The Column or Monument, Erected in memory of Great fire
in London Anno 1666, 202 foot from & Ground to & top of
Flame. Its Circumference 17 $\frac{1}{2}$ feet hollow with Steps up
to & top.

In & Historical Part. In & time of Freeman W. w.
after a Great overflowing of of Rivers, Salinus Reports, that
y. was found upon of Vandys, Carcase of a man, whose length
was 33 Cubits w. in our measure is 14 $\frac{1}{2}$ feet; a prodigious Car-
case! For (according to & foregoing Proportions) his Head should be
5 foot long.

Oling Reports, That after an Earthquake, a Mountain being
cleaved thereby, in it was found a Bodie standing upright
w. was 46 Cubits high; Some Report it to be of Body of Orion, but
whose Bodie former it was, it must be monstrous, for it can be thought
of a man to be 7 foot, & his nose two foot & half long.
Walter Serfors an English Man, born in Taffordshire, he was put
Apprentice to a Smith, & grew so tall that a hole was made for him in of ground
to stand in up to & knees, to make him adequate to his fellow workmen; He was
9 feet

Porter
afterwards to King James & first. He would make nothing to take,
two of tallest Yeomen of Guard (like of Girard & Chev) under
his arms at once, & order them as he pleased.

William Evans, born in Monmouthshire, & may justly be counted
& giant of our age, for he was full 7 foot, & a half in height.
He was Porter to King Charles & first succeeded William Parsons
in his place & exceeded him in height two inches; but not so pro-
portionable in all parts of his Body as Parsons was.

Of Dwarfs. Julia & neice of Augustus, had a little Dwarf
Fellow called Cenopus, whom she much esteemed, he was not above 2 foot
& 5 inches in height; and Romeda a maid Maid of Julia was of the
same height.

Mr. Epistles in his Ecclesiastical History, saith, I saw one John
de Estrix of Mechlen w^m he was brought through Basil to Duke
of Parma then in Flanders Anno 1592; He was 35 years of age, he had
a long beard, was perfect & straight in all his Limbs, & was but 3 foot high.
he could not go up Stair, much less could he get upon a form, but was always
lifted up by a Servant; he was skilled in 3 Tongues, Ingenious & judi-
cious, & with him (a while) I Played a Table.

There was a Dwarf at Wartembreg, at the Nuptials of Duke of Bavaria.
He was turned Cap-a-Pie, Girt with a short Sword & a short Spear in his
Hand; he was put into a Pie, & was set upon a Table, at last, rasing
& Lid, he stepped out, drew his sword, & after manner of a Fencer,
traversed about the Table.

Cardan Reports That he saw a man in Italy, at full age, not above a
foot & half high carried about in a Parrot Cage.

There was a Frenchman of Country of Lamofin of about 4 faine
Height, with a formal Beard, who was shown in a Cage for Money, at
end whereof was a little hatch into which he retired; and w^m of a sudden
was full, he would come out & play upon an instrument.

Of Double Monsters. Brucanon relates of a Monster w^m had only
one Body below the Navel but above, two different ones; w^m any part below
the Navel was hurt both the Bodies participated of pain, if above that Body
only that was hurt. The two upper Bodies would sometimes Quarrel, &
one dying, the other pined away by degrees: It lived 28 years, & could speak
several Languages, & was taught to play on a Musical Instrument.

In the year 1538 there was born one who grew up to stature of a man;
he was double to his Head & Shoulders, so of one face stood opposite to other;
both were of like age, resembling each other both in Beard & Eyes; they
had both the same appetite, & both hungered alike; the voice of both was
almost of same; & both had the same Wife.

Not long since in Elsingorn lived a Woman of good Quality, who by her Account drew near to the time of her delivery, & so provided all things necessary: But in her last Month, her Big Belly seemed to be much swollen. Her time of Travail being come, & of what Pains of Labour going before, she was delivered of a Creature very like unto a Horned Fox of greater Size, which (to the Amazement of Women then Present) with great celerity fought out, & found a hole in the Chamber into which it crept & was never seen after.

In the Year of our Lord 1639, at Norway we Read of a Marvelous Example of a Woman who having often before been delivered of Humane Births, & again big, & after strong Labour was delivered of 2 Eggs. The Womens name is mentioned, & not difference to be discerned between them Egg & Hens Egg, one of you being broke, & the other kept. One Egg came about 17th of April the other next Day.

In the Year of our Lord 1576 upon the 27th Day of Dec. one Ann Fournier about 30 years of age was delivered of a boy & 2 Serpents. This Woman (I faith Copper Branbinus in his History of France) told me upon her Faith that in the former before in an Extream hot day, she had drunk of a Spring in the Ground called Brudetholk, adjoining to Basil w^t she suspected if she had drunk of the Sperm of Serpents; she grew so big & she was fain to carry her belly in a Swaddling-Cord. The Child was very lean of Serpents at each of y^m an Elle long, & thick as the arm of an Infant both so alive as they were, buried by a midwife in the Church-yard of St. Elizabeth.

The Concubine of Pope Nicholas 9th was delivered of a Monster which resembled a Bear. Martin & his Successor entertained a Dame Lady & fearing that she should bring forth other Bears whelps, he caused all the Painted & Carved Beasts about his Palace to be expunged or removed: For this Pope was not ignorant how it shapes & Pictures in one conceived in a Woman's Imagination at the time of Conception, do remain imprinted in the Body of that it is conceived.

At Tertogenbosch a City in Brabant, upon a Solemn Festival, some of the Citizens disguised themselves in several Habits, some like Angels, some like Devils, to amuse & Sport. One of these (who acted a Devil's part) ran home to his House in his Devil's shape, took his Wife threw her upon a Bed saying, he would git a young Devil upon her: he was not deceived; for of that Copulation there was born a Child, such as a wicked spirit is Painted, which at his Coming into the world began to Run & Skip up & down of Chambers.

Some are cut out of their mothers womb, as Scipio Africanus first Julius Caesar, martellius, made off Earl of Suffolk & Duke of England & others, one Cornelius Germanus a German says, this himself had cutouts of 7 Wombs of 6 several women, & living Children.

out of & Historical Remarks of London & Westminster,
2. B. author.

Page 75, To conclude this Bridge for Admirable workmanship
Vastness of foundation & Dementions, & for stately houses, & Rich
shops Built thereon, Surpasseth all others in Europe; it hath
19 Arches Founded in a deep River made of Square Stone Sixty
foot in height & 30 in Breadth distant 20 foot one from an-
other, joined together with Vaults & Collars & Built as fore say
upon dry foot ground being 300 foot in length & 30 foot broad,
& a drawbridge almost in. of middle. This is London Bridge.

Page 71 of Thames Runneth above 9 score miles before it comes to
the Sea. Page 69 The Lea flows further up 30 miles, that is al-
most to Kingston 12 miles above London by Land & 20 by Water.

Page 149 there Suffered upon & out of Religion 277 Persons
of all Qualities & ages, there perishing in the Flame 1 Bishop
21 Divines, 8 Gentlemen, 34 Artificers, 100 Husbandmen,
Servants & Labourers, 26 Wives, 20 Widows, 9 Virgins,
2 Boys, & 2 Infant one of whom springing out of his mo-
ther's womb whilst she was burning at the Stake was again
unmercifully thrown into the fire.
In the 39th of M. Elizabeth 17390 persons died of the Plague in
one year in London. In the first year of K. Char. 1st 35417
persons died of the Plague in London in one year. Page 151,
In 1665, 68596 persons died of the Plague in London in
one year, in 1666 Sep. 2. of Great Fire in London it is in 11
days burnt down 13200 houses.

Memorandum. Nov. 5th 1729 Mr. Bowman was
ordained Minister of Dorchester. Mr. Danforth died May 26th 1731

Upon the Tomb of Mr. Pool in Dorchester it is thus written:

The Epitaph of William Pool, is to be himself made while
he was yet living, in Remembrance of his own death, and
left it to be Engraven on his Tomb, that to being Dead he
might warn Mortality.

or a Resemblance of a Dead man his speaking to Reader.
Ho Passenger tis worth thy pains to stay
And take a Dead Mans lesson by & way!

I was what now thou art, and thou shalt be
What I am now, what does twixt me & thee!
Now go thy way; But stay take one word more,
Thy Staff for ought thou knowst stands next y^e door:
Death is y^e door, yea door of heaven or hell;
Be Wary, be arm'd, Repent, Believe, Repent, Farewell.

Mr. Wm. Pock was a Son, ^{Learned} Gentleman often Schoolmaster in Dorchester.
He died Febr. 24th 1674. aged 81 years.

From Hamilton's New Account of the
East Indies. Vol. 1st Printed 1727.

Page 36. Between Simai & Judda [on y^e S.E. side
of ~~Arabia Felix~~ y^e Red Sea, in ~~Arabia-Felix~~] is
the place where y^e famous Balm of Gilead grows.
It is reported to proceed from a Shrub, & bark of
which is flih, & Vessels fet under y^e wound
receive it, as it drenes from y^e wound.

Page 37. Betlefackee. [a little to y^e southward
of Judda above mentioned] is about 25 English miles
from y^e sea, & is y^e greatest Market for Coffee in the
World. It supplies India, Persia, Turkey in Asia, A-
frica, & Europe, besides England, France & Holland,
with Coffee Beans. The Europe Shipping takes yearly
at Mocha (from whence Betlefackee is about 100
English Miles) about 2000 Tuns, rather more than
less, & y^e other Nations above 2000 Tuns more. The
whole Province of Betlefackee is planted with
Coffee Trees, & are never suffered to grow above 4 or

5 or five yards high; and of Bean or
Berry grows on of Branches & Twigs, first green,
then red, at last a dark Brown colour. The
Berries cling to of Branches like so many in-
sects, & when they are ripe they shake off.

Page 10. Speaking of Mocha abovesaid: Those
who are obliged to drink of Wells near of town
(for they fetch their good water 20 miles) are in
danger of having a long small worm breed in their
Legs or Feet, that inflames the Place where it
breeds, which is unaccompanied with extreme Pains.
In 5 or 6 Days it appears between the tany and
outward Skin, & then puts its Head through, &
when a Patient observes, he takes hold of it with
a pair of Tweezers, and pulls it very gently
out, about an inch or two at a time, in 24 Hours,
& rolls it round an Hem Quill, or some other thing
of that thickness. It is no thicker than a Treble
String of a Violin; and of have seen of them,
after they have been pulled out, about 2 Foot &
an half long. While it is in the Leg, it is daily
covered with a Plaster, & if it chance to break
in of Operation, the Patient will be troubled with
intolerable Pains for a long while; & some-
times they are crippled by it.

Page 84. He says Arrack [in I suppose in of far... a we
car rock] is distilled from Dates. And page 258. He
says the rock is distilled from Today of the Coconuts
The co grow in great abundance about Goa, and of
English are their best Exporters, for they buy great
Quantities yearly for Drunks. And page 354, At the

Island Eylon or Zecan is made of best Stone & is of
Record.

Page 89. About of River Enyates is over grown with
Reeds & Shrubs, & in of Month of Augt are very dry
by & extreme heat of June & July, and the water then
in R. puts them in such agitation, that by friction
they late over, so that before we see land, we see
great smoke by Day, & great fires by night of 4 or 5
Leagues long.

Page 148. The Post in of Moguls Country goes very
Swift, for at every Caravanseray (or I suppose stage)
which are built on High-roads about 10 miles
distance from one another, men, very swift of
Foot are kept ready. The Letters are inclosed in
a gilded Box, which he that carries holds over
his Head when he comes near of Seray, & giving no
tice of his arrival, another takes it ~~12~~ hours to the
next, & so on, night & Day, at 5 or 6 miles an
Hour till it is carried where directed to; so
that in eight Days, Advice are brought from the
furthest part of that large Empire to Court.
The City of Surat [in of Moguls Dominions where of
English live for trade] may be reckoned 200000 Souls.

The Austerities of ^{of} Jouties [or one sort of their Priests]
are beyond belief to those who have not seen the
tastes of them. Some stand on one Foot some years,
with their Arms tied to some Beam of an House, or
branch of a tree over their Heads, & continue in
that posture, except when Nature calls for excre-
ration, for others feed them while they stand.
Their Arms in time falle in that posture, that

ever after they become useless, & are not to be brought again into their natural position. Some fit in of Sufis with their Faces looking uncoated; till they are incapable of altering the Postures of their necks, their Gullett swelling as thick as their Heads; and they also take no sustenance with their own Hands. Others Clench their Fists, & tye them in that posture, till their Finger-nails come through the Back of their Hands. And their Fastings are as incredible. I saw a Woman of about 30 years of Age, who made a Vow of Fasting three Months, to avert some impending calamity threatened by Heaven, that she pretended to foresee. The Governor of Surrat being a Mahometan who generally discourage Gentilism & strive to detect their (eger-de-main & Miracles) ordered if she were found to be put into a Prison without Window without any other sustenance than fair Water, and to be well guarded by Mahometans, to avoid importune. About 80 Days after she was imprisoned, & several other Europeans paid her a visit, & got the door open to to observe her Aspect. We found her in Health, but very weak, & her Pulse beat very low. Her Keepers declared, that she had taken no sustenance but a very small quantity of Water all the while they had a overseing of her, nor did she ever desire any food. She told us, that three or four years before, she has fasted Sixty Days on the same account.

Page 209. Speaking of Bombay [an Island belonging to England] and small Islands thereabout, say there is a 3 or 4 League off an Island belonging to the Portuguese called Steep-hants that is a pretty high Mountain, with a large Cave about half way to the top, hewn out of a solid Rock, & pillars curiously carved, with figures of men

Men & other things. There are several dark Rooms down
out of y Rock. I fixed a Gunne into one of y Rooms, but
I never heard Cannon nor Thunder make such a dreadfull
noise, which continued about half a minute, & y Moun-
tain seemed to shake. Asoon as y noise was over,
a large Serpent appeared, which made us take to our
Heels, & got out of ~~the~~ the Cave at one Door, & he,
in great Haste, went out at y other. I judged him
about 15 Foot long, & two Foot abouth.

Page 260, Speaking of Country about you, I have
seen a Wild Bull killed there whose four Quarter
weighted above a Ton weight, besides y Hide, Head &
Guts. I measured his Horns, & were not long in pro-
portion to their thickness, being 23 inches i.e
Circumference, about y Roots, & his Marrow-
Bones so large, that I took y Marrow out with an
ordinary Silver Spoon. The flesh is not so flauoury
as small Game Cattle.

Page 342. Speaking of y Island of Cylon or Zelcan;
Elephants of this Islands Brood are the most Docile
of any in y World, though not large, few exceeding
3 yards in height. They catch them with y stra-
tagem, & soon tame them when caught.

The way y catch y', as y told me, is, they drive
large stakes into y ground, for 2 or 3 hundred Paces
in a plain, & about 100 Paces distant, they begin
another row of stakes, that also oft meets one of
y ends of y first Row, only leaving 7 or 8 foot be-
tween them open, for a Door; and setting out
from y Door place, are four stakes driven thicker
than in y Row, like a Square Chamber.

In y Door place is a wooden Portcullis or Trap-door
fitted to pull up or let down at pleasure. When all is
done

ready they bring a Female Elephant trained up
for the Decey, & she is put into a Chamber, and the
Trap-door kept open. There are then ~~men~~ placed
in a little close place built out of Stake, at the
Trap-door, & if the male Elephant makes a loud dole-
ful scream. If a male Elephant is near, he presently ap-
proaches the Chamber, on the outside; but finding no entrance
there, he walks along the outside till he is past, then walking
back on the inside of the Stake, he finds the door, & entering
as soon as he is in, he causes men to fall off the Trap-door, &
go to bring two men & spears to accompanying him that is de-
signed to their stables. When he comes near the Trap-door,
it is pulled up, & they enter, & place themselves on each
side. If he moves quickly, they bang him heartily with
their spears, & the male elephant falls down dead too.
When he is tired with their treatment, & is no
longer ready but patience, he even grows tame, & walks
very orderly between his two Guards, whatever they please
to command him, & continues very sociable ever after;
when Rutting-time comes, and then, if he be young,
he becomes very rude & troublesome. That time is
known by a great swelling in his head, & they have
strong hammers ready to put on his legs, and fasten to a
great tree for 8 or 10 Days till his madness continues.

Page 344. The Religion of Zeloa (or Ceylon) is Paga-
nism, & for want of a better image or Reich to ad-
ore, they worship a monkey's tooth. When the
Portuguese were settled there, the Priests lost
their adorable tooth, & a silly fellow, who had
accompanied a Portuguese Ambassadour there from
Cimor, pretended he had found it 3 years after it
was missing. He had it seems seen it, & got one
as like it as possible. The Priests were so over-
joyed that it was found again, that they purchased it
of the fellow for a sum so sum, reported to be above £10000 ster.

Book 2. page 9. Speaking of Fort William in the Country of Bengal, built by the English, says, it was built of Brick & Morter, called Pukkali, which is a Composition of Brick-dust, Lime, Moleasses & cut Hemp; & when it comes to be dry, is as hard & tougher than Lime stone or Brick.

Page 108. Speaking of Atcheen and Island of Sumatra, says, Elephants are very plentiful at Atcheen, and consequently their Teeth, which the Surat merchants buy off for their Markets. In 1702, I saw one that had been kept there about 100 years, but by Report was then 300 years old; he was about 11 feet high, and had a vast deal of Sagacity. Walking young male Elephant grously and thickly, which they usually do in rutting-time, & break their fetters & go astray, this old Elephant is immediately sent after him, & following & track of his Foot, will find him out, & bring him back to his stable, either by fair or foul means. I have taken a piece of Gold Coin & a piece of Lead Coin, (that passeth for money) and thrown them into a puddle of water, & the Elephant would find out the Gold among the Lead, by a nice feeling of his Proboscis. There is a very comical piece of Revenge he took one Sailor in Atcheen 1692. A Ship called Dorothy, commanded by Capt. Thwaites, called at Atcheen for Refreshments in her way from England to Bengal, and two English Gentlemen residing then at Atcheen, went abroad to furnish themselves with what European necessaries they had occasion for; and amongst other things they bought some Worcester Staffs for Cloths, & there being no English Sailor to be had, they employed a Surat Sailor, who kept a Shop on a Bazaar, great market-place, & generally half a dozen, or half a score Workmen to sew in his Shop. It was of old Elephants custom to reach in his Trunk at Doors or Windows as he passed along & side of a street, begging decay-

decay'd Fruits or Roots, & of Inhabitants generally
gabbe them.

As he was one Morning going to the River to be
coasted, with his Cannack, or Rider on his Back,
he chanced to put his Trunk in at a Tailor's Win-
dow, & a Tailor prickt him ~~in the nose~~ with his
needle, instead of giving an Almes. The Ele-
phant seem'd to take no notice of it affront, but
went calmly ~~on~~ on to the River, & was Wash'd;
& being done with Washing, troubled of Water
with one of his poor Feet, and then suck'd up
a good quantity of that dirty Water into his
Trunk, & passing it unmercifully along the same
side of the street before of Tailor's Shop, he
put in his Trunk at the Window, & drew his Nose
on a Tailor with such a force & quantity of Water,
that the poor Tailor & his Life-guard, were blown
off the Table they wrought on, almost frighted out
of their sensles; but the English Gentlemen had
their Cloth's spoiled by the Elephant's comical, but
innocent Revenge.

Page 200. In Cambodia, their way of killing
Elephants is very singular, for they turn a piece
of Iron like a stile, & if front of it is made sharp.
the Woods grow certain Trees with a thick Bark of
a violent Poisonous Quality. They drive a sharp
end of the Stile into the Bark, & let it stay a short
time in it, then put the Stile into their gun Char-
ged with Powder, & coming near & being fire'd
the Stile into its Body. The Elephant being thus wound-
ed, goes along with it, but the man keeps sight of it
for a small space of time, & then it drops down dead.

And

And with of saue poisoned Slugs they kill Cattle & Buffaloes, for their Tongues. This Subtile Poisen has also another strange Quality, that if men be come Hungrey or Thirsty, (as y^e often doe in Woods) they squeeze a few drops of it on a Leaf of a Tree, & they licking of Leaf, it gives immediate Refreshment; But if the Skin be broken, & of juice touch'd part, it proves Mortal without Remedy.

Page 289. There are many usefull Trees in China that bear no Fruit. Some bear Beans, but of those I have seen in India at Surat & Bengal. One sort they have that provokes sleep, by laying some of y^e leaves in y^e Bed near the Patient. The Sandwood Tree is commendable for making Anchors for Shipping. It is prodigiously strong & hard, & has natural Gravity enough to sink it to the bottom of y^e sea. On y^e Mountains of Benfi, near y^e famous Wall that divides China from Tartary, grows abundance of that usefull & Valuable Root Rhubarb whose use is so well known in Europe. The Root Ginseng grows also in Woods there; & when y^e natives go in quest of it, to find it, they are forced to go in y^e night season, with Torches in their Hands, for fear of being attackt by y^e wild Inhabitants of y^e Woods, such as Lyons, Tigers, Leopards, Rhinoceroses &c of y^e Brutal kind, besides dangerous Reptiles, as Serpents & Snakes, which all flee from Fire. I have heard of Serpents thirty feet long, & five in Circumference which lurk all Day in their Den's, & come out at y^e night to prey on animals that lie securly in theirs. This Root Ginseng, is Excellent in Coldyness, is sold at a great Price, somme at three times its weight in silver; but after it is a year old, it goes off at 1/4. per pound. because it is difficult to keep it sound out of it.

The Emperors Revenue, by Report amounts to 180000000 of Tael's.

Book 1st

In Dr Derham's Astro-Theology, Chap 2 of y^e Magnitude of y^e Earth &c He says page 10th That y^e Diam. of y^e Earth is 79677 English Miles, its Surface 199444201 Miles, & its Solid Content 264856000000 Miles. And page 11, y^e Diam. of y^e Mars is Reckoned to be but 4875 English Miles, & y^e Moons Diam. but 2175 Miles, & Mercury 2748 Miles.

Saturn page 12 is Computed at 93151 Miles Diam. & 427,318,300,000,000 Miles in its Bulk; and Jupiter at 120653 Miles in Diam., & 92001120000 Miles in Bulk. And y^e Sun page 13th its apparent Diam. being Computed at 822148 Eng. Miles, & its Solid Content at 296975,000,000,000,000,000 Miles, Supposing y^e face we see of y^e Sun to be its true & Real Globe.

In y^e next Chap. of y^e Immensity of y^e Heavens, he saith y^e is a great difference between former, & latter observations of y^e Sun's Horizontal Parallax (which is equal to y^e Earth's Semi-Diameter viewed at y^e Sun) & so of y^e Sun's Distance: but he fixes upon Mr Cassini's Number, viz. That y^e Par. is 9 $\frac{1}{2}$ seconds & y^e Dist. 21600 Semi-Diameters, or 86051398 Eng. Miles, & double of y^e Number & length of its Diam. viz. 172102795 Eng. Miles. And that ~~1200~~ Syrinus is y^e nearest first Star & yet by y^e best observ^s is found to be in appearance 2766 $\frac{1}{4}$ times less than y^e Sun, & consequently so many times further off, which will amount to above 2 millions of millions of English Miles. And Chap. 3^d y^e Sun Revolves round its axis in about 25 $\frac{1}{4}$ days, found by its spots.

The Same Author says Book 4th That of Periodical motion of Mercury is near 88 Days; Venus in somewhat above 224 Days; The Earth with its Companion the Moon in 365 $\frac{1}{4}$ Days: then Mars in about 687 Days: Next him Jupiter in about 4333 Days: and lastly Saturn in somewhat above 10759 Days.

And in of same Book he says of Sun is nearest to us in of winter as is manifest from of Increment of its apparent Diameter, it being yⁿ 32, 47" & in of Summer it decreases to 31, 40". And y^t of Sun in of winter Solstice moves about a fifteenth part swifter: From whence it comes to pass y^t from of Vernal to of Autumnal Equinox, there are about 8 Days more yⁿ from of Autumnal to of Vernal.

In Book 5 of Snowdon hill in England is of highest in all of Island, & is but 1247 yards high. The highest part of of Alps 2,42 miles, The Pike of Tenariffe one of of highest Riges throughout of Globe, & is but between 3 & 4 miles Perpendicularly above of sea. The highest hills in of Moon as he Quoted Authors are but about $\frac{3}{4}$ of a German Mile.

And some of them to Reach 170, 180, & 100 Miles in length.

Book 6th of Earth whirls about at of Rate of 1043 miles an hour. And of Gravitating Power Exceeds of Centrifugal as 2174 Exceeds 7,540 64 & is above 288 Times, therefore all of parts by quiet & Secure in of Respective places, & Enjoy all of Benefits of accompany this Motion without any disturbance from it. The Suns Ambit is 2582873 Miles & whirls about in 25 $\frac{1}{4}$ days, & so doth Revolve at of Rate 4262 Miles an hour, & is above 21 times as fast as of Earth. Jupiter Revolves at of Rate 39159 Miles an hour at its Equator. The Gravity of all Bodys decrease in proportion of of Square of of Distances Reciprocally; That is at twice of Distance of there is but $\frac{1}{4}$ so much as at a single distance, at thrice a Ninth.

Mr. Greenwood says, The Sun performs an entire Revolution, i.e. 360 Deg^r in 365 Days 5 Hours, 48 Min. & 57 Seconds of time.

1 of Receipt for & Pain in Stomach & Bad Digestion
occasions by Wind &c. I had it of Maj^r Vafal, he of Dr
Montgomery a Dr^r of Note in England.

1 Ounce of Rubarb, 2 Drams of Gentian, 2 Drams of
Orange Peel, Steeped in 3 Pints of Medana Wine about
4 Days; Shake it every Day & strain it off. Take a Glass
when you sit down to Dinner after 1 Monthfull & no
other Time. Note Dr^r Danforth thinks Sena may answer for
& Rubarb, that being very dear. ^{Cardalga}

Another for & ^{di} Cardalga or Pain in Stomach &c.

Species of Hira Simple 2 ounces, Sena 1 ounce, 3 quarts
of Wine. 2 ounces of Anniseed or Fennel Seed or Car-
raway seed. Steep them 4 or 5 Days a little warm, take abt
2 spoonfulls in the Morning & 2 spoonfulls in the Afternoon.
is I had of Dr^r Danforth, & is called Vinum Laurum or Hira
iron. This I have found good by from French Doctors.

(The Question ~~was to be proposed~~ for our Discus-
sion is this,) Whether it is lawful to deliver up
an Innocent Person for the safety of a Republick
When a Republick is besieged by an inveterate
Enemy, it is certainly the Duty of the Inhabitants
to make all the Resistance possible, before they
themselves deliver themselves up to their will.
But, after they are conquered, they receive Intelli-
gence from the Enemy, that (by delivering up
a certain Person whom they themselves know
to be innocent) the remainder shall be left

in peaceable possession of their Habitations: though it seems a little hard, Would it not ~~ever~~
truly be the best Way to deliver him
up to their will, ^{rather} than that, ~~they~~ all, and ^{the Inhabitants}
the same Person ~~all~~ should be doom'd to
remediless Destruction? surely it would.
therefore as the safety of the Republick
depends upon ^{one} of the Citizens, surely it is
the best Way to deliver him up, rather
than that all should be captivated.

though this may be call'd an Evil, yet
the Deliverance of the whole ^{is aggrivated}, therefore
of two Evils, we ought always to take
the least.

*Disputatio forensis, non scripta boni
auctore, ut Lectio facile discernatur.*

From Archibald Patoun's Book of Navigation.

The number of Solid Quines contained in a Gallon, Bushel &c. as determined by Act of Parliament, are as follows,

A Gallon of Ale or Beer	282
of Wine	235
of Corn	263,8
A Bushel of Malt	contains 2150,4
of Coals	2246
A Scots Pint	1502

Solid Quines.

The Variation of 4 Degrees was first observed at London, in the year 1580, to be 9°-15' Easterly, and in 1622 it was 6°-0' E. &c. &c. in 1634, it was 7°-5' E. still decreasing, & of Steele approaching to 4 Meridians, till it coincided with it, at which time there was no variation at all: after the variation began to be westerly; and in year 1672, it was observed in 2°-3' W., and in year 1683, it was 1°-30' W., and since that time the variation continues at 60' points to increase westerly; but how far it will go that way, Time & Observations will probably be the only means to discover.

Again at Paris 8°-30' Variation was 3°-00' E. and in 1666, there was no variation; but in 1681, it was 2°-30' W. and still continues to go westerly.

In short, from Observations made in different parts of the World, it appears, that in different Places of Variation, it differs both as to its Quantity & Denomination; the true being E. & W. in one Place, & West. in another; the true cause & Theory of which, for want of a sufficient Number of Observations, has not as yet been

	Lat.	Long. W.
Comps Recified. St. John's Harbour	47-28	51-29
Newfoundland	52-10	54-57
Bay of Brest	47-04	68-15
Quiberon	47-35	60-45
Anti-Offi Island of Middle	46-10	58-30
Cape Brittan	43-43	64-25
Cape Sable	44-35	64-07
Port Royal	43-20	68-40
Halifax Bay Entrance	42-28	69-17
Boston Entrance		

To fine y^e Superficial Content of a Globe.
Rule. Multiply y^e Diameter by y^e Circumference & y^e Product is y^e Superf. Cont.

To fine y^e Solide Cont. of a Globe.

Rule. Multiply y^e Superficial Content by one
6th part of y^e Diam. & y^e Product is Solide
Cont.

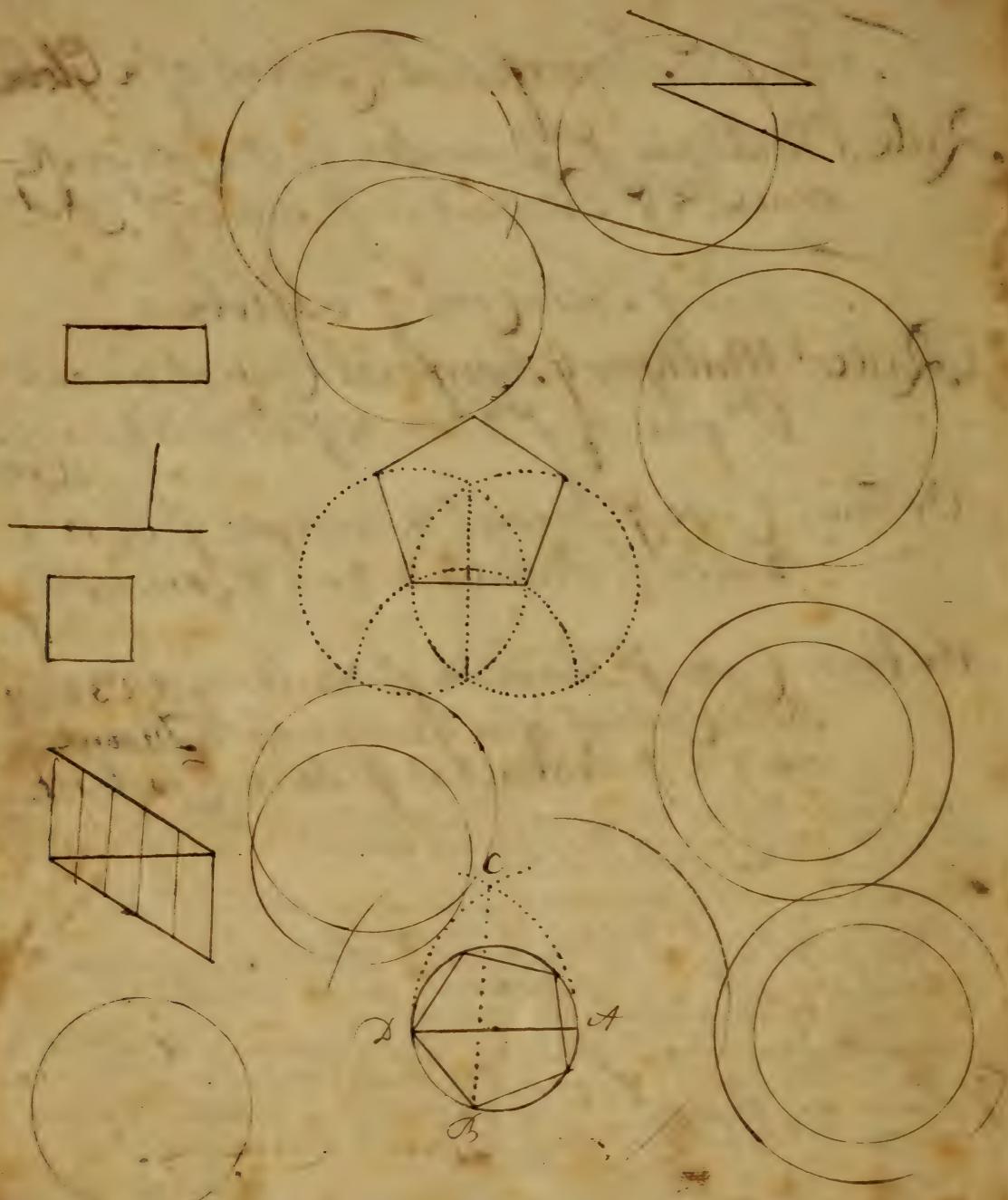
Or Thus. Cube of Diam. & multiply it by 11 &
Divide y^e Product by 21 & y^e Quot. is Solide
Cont.

Or Thus. Cube of Diam. & y^e Mult. by 5238 (y^e
Solid Content of a Globe whose Diam. is
one) & y^e Product is y^e Solide Content.

The Superficial Content of a Cylinder is found by mul.
y^e Circum. of one of y^e Bases into y^e Length, and to y^e Product
adding y^e areas of y^e two Bases.

The Solidity of a Pyramid, is found by mult. y^e area of
Base into $\frac{1}{3}$ of y^e Height. The Super Content is found by
mult. y^e Circum. of y^e Base in half y^e Line joining the
Vertex & any Point in y^e Circumference, & that Pro-
duct added to y^e area of y^e Base.

The Superficial Content of y^e frustum of a Cone is
found by adding to y^e Super. Cont. of y^e whole Cone, twice
y^e area of y^e Base of y^e small Cone, and from y^e sum
taking y^e Super. Cont. of y^e small Cone.



The Proportions to find Sun's Altitude for any
Hour of the Day, are as follows,

As of C. S. in of the hour from the Merid. or Noon,
is to Rad.

So is of Tang. of the Lat.

To of Tang. of a fourth Ark.

Then consider of Dec. of Sun, & of hour proposed; If the Lat. &
Dec. be alike, both N. or both S., and of hour proposed be be-
tween Noon & Six, take of Dec. out of 4th Ark, & Rem-
ainder shall be of 5th Ark: But if of hour fall between
6 & midnight, or of Lat. & Dec. be unlike (one N. & other
S.) Add of Dec. to 4th Ark, & of Sun shall be of 5th Ark
if of Sun exceed 90 deg. take it from 180 deg., the Re-
mainder is of 5th Ark. The 5th Ark being found say,

As of Sun of 4th Ark

To of Sun of Lat.

So is of C. S. in of 5th Ark,

To of Log. of Altitude.

Or thus, As Rad. to of C. Tang. of Lat.

So is of C. S. in of Angle from of Meridian

To of Tang. of a fourth Ark.

From Cont. of of Sun's Dec. Subtract of 4th Ark,
the Remainder is of 5th Ark.

As C. S. in of 4th Ark to Ar.

is to of Log. of Lat. of 5th Ark

So is of C. S. in of 5th Ark

To of Log. of Altitude

Note, of C. S. in of 4th Ark is 3 Ard., but none of
the rest, and when these 3 Log. are added together
& of Rad. Subtracted from of Sun, the Remainder is
of Log. of 5th of Altitude Required.

A Table of the Sun's Altitude for every
Hour in the Day, at every 6° degr. of
Declination; for Latitude 42° 25' N.

North Declin. South Declin.

Declina.	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
	5. 7	6. 6	7. 5	8. 4	9. 3	10. 2	11. 1	12
	deg.	Alt.	Alt.	Alt.	Alt.	Alt.	Alt.	Alt.
Trop. vs	0. 0	0. 0	0. 0	4. 0	12. 06	18. 30	22. 23	24. 5
18. deg. Dec.	0. 0	0. 0	0. 0	8. 12	16. 44	23. 33	27. 32	29. 35
12. ^{deg} Decl.	0. 0	0. 0	2. 40	12. 46	21. 44	29. 2	33. 33	35. 35
6. ^{deg} Declin.	0. 0	0. 0	6. 52	17. 16	26. 39	34. 26	39. 23	41. 35
Equator	0. 0	0. 0	11. 02	21. 40	31. 28	39. 49	45. 10	47. 35
6. ^{deg} Decl.	0. 0	3. 50	18. 05	25. 58	36. 08	44. 27	50. 15	53. 35
12. ^{deg} Decl.	0. 0	8. 26	19. 6	30. 6	40. 36	49. 59	56. 16	59. 35
18. ^{deg} Decl.	1. 32	12. 0	22. 58	34. 02	44. 49	54. 44	62. 29	65. 35
Trop. 69.	5. 06	15. 20	26. ¹² ₂	37. 35	48. 23	58. 48	68. ⁴⁵ ₂₁	71. 05

The Proportions to find of Sun's Altitude for any Azimuth
if the Sun be in the Equator are

As the Sine of $90^{\circ} - 60^{\circ}$

To the Co Sine of the Azimuth from the Meridian

So the Co Tan. of the Latitude

To the Tan. of the Altitude at the Equator.

If the Sun have Declination, the proportions are,

As the Sine of the Latitude

To the Sine of the Declination

So the Co Sine of the Altitude at the Equator

To the Sine of a fourth Ark.

When the Latt. & Decl. are both alike in all Azimuths
from the Prime vertical unto the Meridian, add the fourth
ark unto the ark of the altitude at the Equator.

When the Latt. & Decl. are both alike, & the Azimuth more
than 90° distant from the Meridian, take the altitude at the Equator
out of this fourth ark.

When the Latt. & Decl. are unlike, take the fourth ark out
of the ark of altitude at the Equator, so shall the remainder be
the altitude of the Sun for that Azimuth.

The distance between the Equator & the Tropic may be
a little more than $\frac{1}{3}$ of the distance between the Tropic & the Center.

m. alt.	10	20	30	40	50	60	70	80	90	100	m. alt.
20	m. 2.	m. 3.	m. 2.								
Trop. 6°	71-05	70-50	70-08	68-52	66-34	64-03	59-53	54-08	46-16	36-14	24-44
20 Dec. No.	67-35	67-18	66-30	65-03	62-50	59-37	55-05	48-52	40-38	30-28	19-06
12 Dec. No.	63-35	63-16	62-21	60-53	58-13	54-38	49-41	43-01	34-26	24-07	12-54
8 Dec. No.	59-35	59-14	58-12	56-23	53-37	49-43	44-22	37-18	28-23	17-57	6-51
8 Dec. Nor.	55-37	55-12	54-04	52-04	49-04	44-50	39-06	31-39	22-27	11-54	0-55
4 Dec. No.	51-35	51-10	49-56	47-46	44-30	39-59	33-53	26-04	16-36	5-56	0-0
Equator	47-35	47-08	45-48	43-28	39-58	35-07	28-41	20-31	10-46	0-0	0-0
4 Dec. N.	49-35	43-06	41-40	39-10	35-26	31-05	23-29	14-58	4-56	0-0	0-0
8 Dec. So.	39-35	39-04	37-32	34-52	30-52	25-24	18-16	09-23	0-0	0-0	0-0
12 Dec. So.	35-35	35-02	33-24	30-33	26-19	21-31	13-00	3-44	0-0	0-0	0-0
16 Dec. So.	31-35	31-00	29-45	26-03	21-43	15-36	7-41	0-0	0-0	0-0	0-0
20 Dec. So.	27-35	26-58	25-06	21-53	17-06	10-37	2-17	0-0	0-0	0-0	0-0
Trop. 15°	24-05	23-26	21-28	18-04	13-02	6-11	0-0	0-0	0-0	0-0	0-0
	24-05	23-26	21-28								
10.	20.	30.	40.	50.	60.	70.	80.	90.	100.		

A Table of Sines Altitude to every 4° degrees
of Declination for every tenth Altitude
Latitude 42°-25° N.

This belongs to
uppermost line
& not being
place it.

A Table for dividing of the Horizon-line
in Gunters Quadrant, to every 5th degree so far² 30.

For drawing of the Horizon & proportion is,

As Co Tan. of $\frac{1}{2}$ Latt.

To Tan. of greatest Declin.

So is $\frac{1}{2}$ Sn. of $90^{\circ}-00'$

To $\frac{1}{2}$ Sn. of $\frac{23-25}{2}$ (& Tropic
to $\frac{1}{2}$ Sn. of $\frac{1}{2}$ Intersection, w² the Horizon shall cross

For dividing of the Horizon

As Radius, or Sn. $90-00'$

is to $\frac{1}{2}$ Sn. of $\frac{1}{2}$ Latitude

So is $\frac{1}{2}$ Tan. of the Horizon

To $\frac{1}{2}$ Tan. of $\frac{1}{2}$ Ark. in $\frac{1}{2}$ Quadrant of shall divide

{Tropic 32

5	10	15	20	25	30
23-22	6-47	10-14	13-47	17-27	21-17

A Table of $\frac{1}{2}$ Sun's Declination to be set upon several
Azimuths. The Proportions are

As $\frac{1}{2}$ Sn. of $90-00'$

To $\frac{1}{2}$ Co Sn. Latitude

So $\frac{1}{2}$ Co Sine of $\frac{1}{2}$ Azimuth from $\frac{1}{2}$ Meridian

To $\frac{1}{2}$ Sine of $\frac{1}{2}$ Declination

60	70	80
21-39	14-37	7-22

A Table of y^e Suns Meridiam Altitude
for every 5th Day of y^e Year, for Latt. 42°-25 N.

Months	0	5	10	15	20	25
	0. m.	0. m.				
Jan. ^r	25-54	26-36	27-39	28-50	30-10	31-37
Febr. ^r	33-51	35-13	36-59	38-49	40-43	42-38
March	44-13	45-47	47-35	49-43	51-40	53-36
April.	56-12	57-38	59-23	61-02	62-36	63-46
May.	65-41	66-39	67-45	68-42	69-28	70-08
June	70-45	70-58	71-05	71-00	70-46	70-21
July	69-39	69-03	68-10	68-08	65-58	64-41
August	62-41	61-27	59-40	58-08	56-21	54-31
Sept. ^r	51-53	50-20	48-23	46-26	44-29	42-33
October	40-15	38-45	36-55	35-11	33-30	31-53
Novem. ^r	29-53	28-50	27-39	26-37	25-45	25-03
Decem. ^r	24-28	24-13	24-05	24-10	24-26	24-54
Jan. 30	Mar. 30	Apr. 30	May. 30	Jun. 30	July. 30	Aug. 30
33-12	55-28	65-25	70-37	69-47	63-17	52-39
	Sep. 30	Oct. 30	Nov. 30	Dec. 30		
	48-38	30-27	24-33	25-33		

P.P.L. Bindery,
JUL 21 1902

